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1982-1983 Economic Handbook of the Machine Tool Industry

Compiled by the Statistical Department

National Machine Tool Builders' Association
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FOREWORD

For the U. S. machine tool industry, 1981 was a year of retrenchment; the first year of significant decline after six years of strength. The most accurate indicator of the severity of the decline is the industry's rate of new order acquisition. After experiencing virtually uninterrupted growth from mid-1975 through mid-1980, orders for new machine tools at first leveled-off and then began a cyclical decline as the nation's economy slipped further into recession.

Net new orders for 1980 were 15% below their record 1979 level and fell a further 37% in 1981. The unexpected severity of the 1981-82 recession, especially in such major markets for machine tools as the automotive, aerospace, farm implement, and construction equipment industries, has led to further order declines in early 1982. Through the first six months of the year, net new orders for metal cutting and metal forming machines were 50% below the already depressed levels of 1981. Current monthly order totals are the lowest they have been since the recession of 1974-75.

Clearly, these trends are of concern to the machine tool industry. However, they are also a cause for concern on a larger scale. These statistics indicate that American industry is failing to modernize its obsolescent capital asset base, a fact that foreshadows little improvement in our nation's already flagging rate of productivity improvement.

As evidence of the machine tool industry's expansion of its capacity to produce in response to the a large backlog of unfilled orders built up during the 1975-80 order surge, shipments of new machine tools increased during 1981 in spite of the slumping order rate. Shipments of metal cutting and metal forming machines reached $5.1 billion in 1981, a post-WWII nominal dollar industry record. This is up 9% from the previous high set in 1980.

Because of the decline in orders, the industry's shipments greatly exceeded the value of new orders received. Combining the net new order total of $2.9 billion with the shipment rate of $5.1 billion produced a decline of $2.2 billion in the industry's backlog of unfilled orders. At year's end, the unfilled order total stood at $3.3 billion, a substantial decline from the record high of $5.6 billion registered in mid-1980.

As we go to print with the 1982-83 edition of this Handbook we find our industry gravely concerned. At present the industry is being buffetted from two directions. **The first is the effect of the severe economic downturn and the decline in the nation's rate of capital spending resulting from it. The second is the phenomenal influx of imported machine tools. In 1981 over 40% of all machine tools installed in the U.S. were built by foreign manufacturers.** This is a level of import penetration higher than that experienced by the "import beleaguered" American auto industry. Our hopes for recovery lie with expectations of a strong economic turnaround and the belief that our industry and its products are competitive with those of any other nations.

The machine tool industry has on many occasions voiced its concern over the health of the U.S. economy, particularly the status of our manufacturing industries. The failure of American industry to maintain its capital stock is acknowledged by many economic experts to be a major reason behind the decline in the nation's productivity growth rates and its inability to reduce the underlying inflationary trends in the economy. NMTBA strives to make the public and our

elected representatives in Washington aware of these problems. Through this understanding, support can be generated for legislative measures which will provide a framework of incentives for future investment to ensure that America's standing as the world's leader in technological and industrial strength is maintained.

The cyclical nature of domestic machine tool demand has led the industry to seek stable growth by increasing its share of the rapidly expanding world machine tool market. International efforts by the industry include the biennial International Machine Tool Show in Chicago (the largest U. S. industrial exposition), participation in overseas machine tool shows, and frequent trade missions to explore new markets and serve existing ones.

Looking forward into the 1980's, we feel that the machine tool industry will be called upon to play an even more vital role in America's industrial structure. Since the turn of the century, and especially in the post-World War II era, the United States has undergone a dramatic shift in its economy away from agriculture and manufacturing toward service industries. This has placed a responsibility on each farmer to produce more food to feed our expanding population and has placed an equivalent burden on each industrial employee to produce an ever larger volume of goods for each member of our consumer society.

Just as mechanization was the answer to the problem of farm productivity, new and better capital equipment is the answer to the problem of industrial productivity. The machine tool industry looks forward to the technological challenge of obtaining more output from each manufacturing worker as it continues to provide its customers the world's most reliable, most productive machine tools.

The 14th edition of the Economic Handbook again offers industry executives, market researchers, legislators, administrators and students an expanded collection of data on the economy and the industry.

Wide fluctuations in currencies and varied definitions of different time periods account for occasional differences in the data for what appear to be identical subjects in this Handbook. As far as possible, these differences are explained in the chapter introductions, footnotes and the "Explanation of Terms" section at the end of the Handbook. Special explanatory notes for selected data series are also included. The NMTBA Statistical Department is also available to answer any questions concerning this publication. We are constantly trying to improve the value of this book. Your comments and suggestions for future editions are welcome.

James A. Gray
President

August, 1982

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Education- Pure and Simple

Today, machine tools affect the life of nearly everyone. But not everyone knows what machine tools are or what they do.

Among the many films available from NMTBA is "One Hoe for Kalabo." Already seen, free of charge, by over ten million people, it's a beautiful, full-color movie that explains the machine tool industry. It shows how sophisticated machinery now does the work that muscles used to do.

It starts in Kalabo—a small African village where natives still produce tools from iron ore. It then takes the viewer inside modern industrial operations responsible for today's technology and lifestyle.

"One Hoe for Kalabo" is not a sales film. It is purely educational. And it will give many students, associations and interested groups a new understanding of the machine tool industry.

If you're interested, you can order "One Hoe for Kalabo" from Modern Talking Picture Service, Inc., Scheduling Center, 5000 Park Street North, St. Petersburg, Florida 33709.

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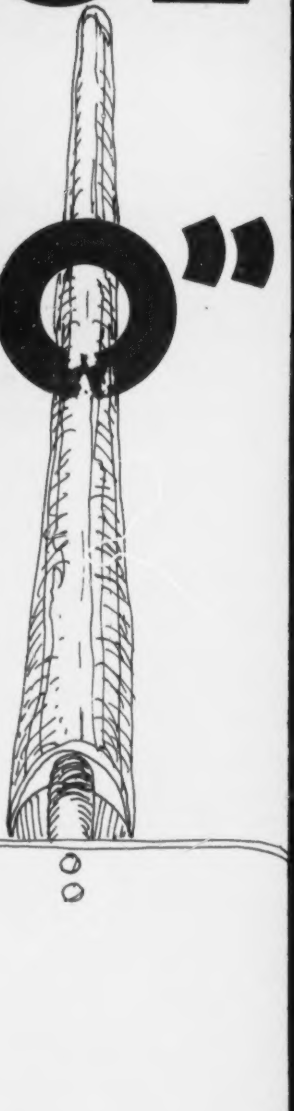


1

NATIONAL ECONOMY AND MACHINE TOOLS

Man is a tool-making animal. Since the beginning of history man has used his tools to make even better tools. The culmination of these efforts are today's modern machine tools. These are the machines that form the basis of much of our modern civilization.

A machine tool is a power-driven machine, not hand held, that is used to cut, form, or shape metal. Few, if any, products and services of an industrialized country would exist if it were not for machine tools. There would be no trains, no ships, no planes, no cars. There would be no power plants, no electric lights, no refrigerators, or other electrical appliances. And, without agricultural machines, without modern transportation, and without refrigeration—all dependent on modern machine tools—there would be no way to feed the more than 220 million people in this country.

Yet, such is the efficiency and longevity of the products of the machine tool industry that its present production has always represented only a small part of the nation's total output. The entire U.S. machine tool industry is smaller than many individual corporations. Even the limited data available for the first years of this century show, for instance, that metalcutting machine tools made up only slightly more than 10 cents for every $100 produced in goods and services. In 1981, shipments of complete machine tools made up just over 19 cents of every $100 of Gross National Product.

Comparisons of machine tool consumption with capital expenditures by durable goods manufacturing industries show that machine tools make up a comparatively small but significant part of total expenditures for plant, machinery, and other equipment.

Machine tools are typically installed as capital equipment in metalworking industries. The data on machine tools installed in U.S. plants (see Chapter 9) and data collected by NMTBA indicate that the major users of machine tools are the metalworking industries: fabricated metal products, machinery, and transportation equipment (among the latter, primarily the automobile and aerospace industries). Thus, this chapter focuses on private investment, on expenditures for new plant and equipment, and on the orders and shipments of the metalworking industries. The business activity in these industries is likely to affect their capital expenditures and, in turn, to affect the orders that flow to the machine tool industry. However, many other factors also seem to affect the ordering of new machine tools.

The machine tool industry is highly sensitive to the treatment of corporate capital consumption allowances such as investment tax credits and depreciation. Changes in these affect the willingness and ability of the industry's customers to make machine tool purchases. The work of many students of the machine tool industry has indicated that corporate profitability, financial conditions, and the general level of business confidence are also important determinants of machine tool order activity.

Capacity utilization is recognized as another significant determinant of future business investment in plant equipment and thus in machine tools. While attempts to measure the utilization in a broad spectrum of industries are fairly recent, there are several existing series on capacity utilization in manufacturing. In this issue, three of the available measures are presented. Also included are capacity utilization series for selected machine tool consuming industries as published by the Bureau of Economic Analysis and the McGraw-Hill Publications Company.

Currently, there is much concern in the United States about the erosion of our capital stock. For instance, studies have shown that the average age of the machine tool population in this country has gone up significantly in recent years. Investment apparently has not kept up with the need to replace aging capital assets in U.S. manufacturing industries. Several tables showing the stock of capital assets in various machine tool consuming industries are in this chapter. Of particular interest are the tables relating purchases and depreciation of capital goods in manufacturing industries, and the tables of business capital appropriations in current and constant dollars.

Many figures shown in this chapter are in current dollars . . . dollars not adjusted for changes in purchasing power. Overall changes in the purchasing power of the dollar, as measured by producer or consumer prices indexes, provide a measure of the erosion of its value. To measure the impact of price increases, several indexes and "price deflators" to generate "constant dollar" figures are available. These include indexes of producer prices for metal cutting and metal forming machine tools. However, because these indexes make no adjustments for changes in the qualitative characteristics of machine tools, they should be used with caution.

Maintenance and expansion of the export market for U.S. machine tools, and the impact of machine tool imports on the domestic market, have been matters of concern to U.S. machine tool builders during most of this century. Until 1978, the U.S. machine tool balance of trade had continuously been positive and had helped offset trade deficits incurred in other sectors. The development of a sizable balance of trade deficit in machine tools is particularly troubling because the competitive impact of machine tool imports is understated in current statistics. The value data for imports exclude important cost elements such as insurance and ocean freight which also affect the balance of payments. These shortcomings of the foreign trade statistics are discussed in Chapter 5, as are other detailed aspects of machine tool foreign trade.

To protect and expand foreign markets many U.S. businesses have established plants in foreign countries. Direct foreign investment increased rapidly during the 1960's and 1970's and U.S. machine tool builders joined this move. While no information is available on machine tool direct foreign investment, data are presented for U.S. direct foreign investments in various countries by all industries and by manufacturing industries.

Definitions and discussions of the terms used in this and other chapters are in the glossary at the end of this book.

THE NATIONAL ECONOMY AND MACHINE TOOLS
1958 to Date

Year	GNP (r) Billion $	Shipments in Billion Dollars			Shipments in Million Dollars		
		All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry	Machine Tool Products	Complete Machine Tools
1958	$ 449.7	$ 327.0	$ 162.8	$ 23.4	$ 998	$ 870	$ 591
1959	487.9	363.4	187.3	26.6	1,112	975	616
1960	506.5	370.5	190.6	26.8	1,266	1,126	744
1961	524.6	371.1	187.4	26.6	1,242	1,102	751
1962	565.0	400.3	207.1	29.2	1,430	1,223	821
1963	596.7	420.7	219.4	31.0	1,502	1,370	896
1964	637.7	448.0	235.6	35.3	1,791	1,650	1,164
1965	691.1	491.9	266.7	39.5	2,107	1,955	1,426
1966	756.0	538.4	295.8	46.9	2,554	2,319	1,685
1967	799.6	557.8	303.2	49.2	2,841	2,585	1,806
1968	873.4	603.2	332.4	51.0	2,817	2,500	1,727
1969	944.0	642.5	353.7	56.1	2,835	2,507	1,598
1970	992.7	634.0	338.6	56.5	2,598	2,278	1,443
1971	1,077.6	671.1	359.7	56.0	2,019	1,698	998
1972(r)	1,185.9	756.3	408.3	65.8	2,112	1,929	1,019
1973(r)	1,326.4	875.2	476.2	77.8	2,777	2,596	1,501
1974(r)	1,434.2	1,017.5	530.7	92.5	3,580	3,189	2,031
1975(r)	1,549.2	1,039.1	523.9	95.8	3,834	3,432	2,452
1976(r)	1,718.0	1,185.6	608.3	105.5	3,567	3,197	2,060
1977(r)	1,918.0	1,358.4	711.2	122.2	3,943	3,675	2,281
1978(r)	2,156.1	1,523.4	814.2	143.2	4,978	4,735	3,013
1979(r)	2,413.9	1,727.3	909.6	166.7	6,053	5,762	3,877
1980(r)	2,626.1	1,845.9	936.0	182.8	NA	NA	4,692
1981(p)	2,925.5	1,997.8	1,019.9	204.6	NA	NA	5,096

NA - Not Available.   p - Preliminary.   r - Revised.

Sources: Col. 1: U.S. Department of Commerce, "Business Statistics, 1977" and "Survey of Current Business" (monthly). Cols. 2, 3 and 4: U.S, Bureau of the Census. "Manufacturers' Shipments, Inventories and Orders: 1967-1978" (revised) and Series M3-1 (monthly). Cols. 5 and 6: U.S. Bureau of the Census, "Annual Survey of Manufactures," M (AS)-1 & 2 and Preliminary 1977 "Census of Manufactures". Col. 7: National Machine Tool Builders' Association, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

The last three columns cover the following three different entities.

Machine Tool Industry: (Standard Industrial Classifications 3541 and 3542). All shipments orginating in establishments whose primary products are machine tools. The figures include other-than-machine tools produced in these establishments as well as miscellaneous receipts.

Machine Tool Products: All machine tool products shipped by the machine tool industry and by other industries. Excludes all shipments of items which are not classified as machine tool products.

Complete Machine Tools: Shipments of complete machine tools, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines, as reported by NMTBA.

THE NATIONAL ECONOMY AND MACHINE TOOLS

Indexes, 1958 to Date

1967 Shipments = 100

Year	GNP	All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry (a)	Machine Tool Products (a)	Complete Machine Tools (a)
1958	56.2	58.6	53.7	47.6	35.1	33.7	32.7
1959	61.0	65.1	61.8	54.1	39.1	37.7	34.1
1960	63.3	66.4	62.9	54.5	44.6	43.6	41.2
1961	65.6	66.5	61.8	54.1	43.7	42.6	41.6
1962	70.7	71.8	68.3	59.3	50.3	47.3	45.5
1963	74.6	75.4	72.4	63.0	52.9	53.0	49.6
1964	79.8	80.3	77.7	71.7	63.0	63.8	64.5
1965	86.4	88.2	88.0	80.3	74.2	75.6	79.0
1966	94.5	96.5	97.6	95.3	89.9	89.7	93.3
1967	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1968	109.2	108.1	109.6	103.7	99.2	96.7	95.6
1969	118.1	115.2	116.7	114.0	99.8	97.0	88.5
1970	124.1	113.7	111.7	114.8	91.4	88.1	79.9
1971	134.8	120.3	118.6	113.8	71.1	65.7	55.3
1972(r)	148.3	135.6	134.7	133.7	74.3	74.6	56.4
1973	165.9	156.9	157.1	158.1	97.7	100.4	83.1
1974(r)	179.4	182.4	175.0	188.0	126.0	123.4	112.5
1975(r)	193.7	186.3	172.8	194.7	135.0	132.8	135.8
1976(r)	214.9	212.5	200.6	214.4	125.6	123.7	114.1
1977(r)	239.9	243.5	234.6	248.4	138.8	142.2	126.3
1978(r)	269.6	273.1	268.5	291.1	175.2	183.2	166.8
1979(r)	301.9	309.7	300.0	338.8	213.1	227.9	214.7
1980(r)	328.4	330.9	308.7	371.5	NA	NA	259.8
1981(p)	365.9	358.2	336.4	415.9	NA	NA	282.2

NA - Not Available. p - Preliminary. r - Revised.

(a) See notes on page 4.

Sources: U.S. Department of Commerce, U.S. Bureau of the Census, and NMTBA.

GROSS NATIONAL PRODUCT AND COMPONENTS
1959 to Date

Year	Gross National Product	Personal Consumption Expenditures	Gross Private Domestic Investment	Net Exports of Goods and Services	Government Purchases of Goods and Services
In current dollars (billions)					
1959	$ 487.9	$ 310.8	$ 78.1	$ 1.4	$ 97.6
1960	506.5	324.9	75.9	5.5	103.0
1961	524.6	335.0	74.8	6.6	108.2
1962	565.0	355.2	85.4	6.4	118.0
1963	596.7	374.6	90.9	7.6	123.7
1964	637.7	400.5	97.4	10.1	129.8
1965	691.1	430.4	113.5	8.8	138.4
1966	756.0	465.1	125.7	6.5	158.7
1967	799.6	490.3	122.8	6.3	180.2
1968	873.4	536.9	133.3	4.3	199.0
1969	994.0	581.8	149.3	4.2	208.8
1970	992.7	621.7	144.2	6.7	220.1
1971	1,077.6	672.2	166.4	4.1	234.9
1972	1,185.9	737.1	195.0	0.7	253.1
1973	1,326.4	812.0	229.8	14.2	270.4
1974	1,434.2	888.1	228.7	13.4	304.1
1975	1,549.2	976.4	206.1	26.8	339.9
1976	1,718.0	1,084.3	257.9	13.8	362.1
1977	1,918.0	1,205.5	322.3	-4.2	394.5
1978	2,156.1	1,384.7	375.3	-0.6	432.6
1979	2,413.9	1,510.9	415.8	13.4	473.8
1980	2,626.1	1,672.8	395.3	23.3	534.7
1981	2,925.5	1,857.8	450.5	26.0	591.2
In constant 1972 dollars (billions)					
1959	$ 721.7	$440.4	$108.0	$ 2.7	$170.6
1960	737.1	452.0	104.7	7.7	172.8
1961	756.6	461.4	103.9	8.5	182.9
1962	800.3	482.0	117.6	7.5	193.2
1963	832.5	500.5	125.1	9.4	197.6
1964	876.4	528.0	133.0	12.8	202.6
1965	929.3	557.5	151.9	10.1	209.8
1966	984.8	585.7	163.0	6.5	229.7
1967	1,011.4	602.7	154.9	5.4	248.5
1968	1,058.1	634.4	161.6	1.9	260.2
1969	1,087.6	657.9	171.4	0.9	257.4
1970	1,085.6	672.1	158.5	3.9	251.1
1971	1,122.4	696.8	173.9	1.6	250.1
1972	1,185.9	737.1	195.0	0.7	253.1
1973	1,255.0	768.5	217.5	15.5	253.5
1974	1,248.0	763.6	195.5	27.8	261.2
1975	1,233.9	780.2	154.8	32.2	266.7
1976	1,300.4	823.7	184.5	25.4	266.8
1977	1,371.7	863.9	213.5	21.9	272.3
1978	1,436.9	904.8	229.7	24.6	277.8
1979	1,483.0	930.9	232.6	37.7	281.8
1980	1,480.7	935.1	203.6	52.0	290.0
1981	1,510.3	958.9	214.8	44.9	291.7

Note: Individual components may not add to total GNP due to rounding.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

ACTUAL AND PROJECTED GNP AND OTHER ECONOMIC INDICATORS

	Measure	Actual 1979	Actual 1980(r)	Actual 1981(r)	Projection 1982
Gross National Product	Bil. $	$2,413.9	$2,626.1	$2,925.5	$3,136.0
GNP implicit Price Deflator	1972 = 100	162.8	177.4	193.7	208.0
GNP in Constant Dollars	Bil. 1972 $	1,483.0	1,480.7	1,510.3	1,504.0
Industrial Production	1967 = 100	152.5	147.1	151.0	147.0
Unemployment Rate	Percent	5.8	7.2	7.6	9.0
Corporate Profits After Taxes	Bil. $	167.8	163.2	155.5	143.5
Plant and Equipment Expenditure	Bil. $	269.6	295.6	321.5	345.1
Change in Business Inventories	Bil. $	17.5	-5.9	16.2	0.3
Personal Consumption Expenditures	Bil. 1972 $	930.9	935.1	958.9	973.5
Federal Government Purchases	Bil. 1972 $	101.7	108.1	111.5	114.0

r - Revised.

Sources: Actual: U.S. Department of Commerce, "Survey of Current Business" (monthly). Projected: American Statistical Association and National Bureau of Economic Research panel of forecasters, "Economic Outlook USA, Spring 1982".

SELECTED PRICE DEFLATORS
1962 to Date

Year	Price Deflators: Gross National Product	Personal Consumption Expenditure	Producers' Durable Equipment	Metal-Working Machinery & Equipment
	1972 = 100			
1962	70.6	73.7	79.4	72.6
1963	71.7	74.8	79.7	72.8
1964	72.8	75.9	80.1	74.3
1965	74.4	77.2	80.6	76.3
1966	76.8	79.4	82.1	79.8
1967	79.1	81.4	84.3	83.2
1968	82.5	84.6	87.2	86.5
1969	86.8	88.4	89.9	89.7
1970	91.4	92.5	93.2	94.8
1971	96.0	96.5	97.2	97.6
1972	100.0	100.0	100.0	100.0
1973	105.7	105.7	101.8	104.4
1974	114.9	116.2	109.3	122.2
1975	125.6	125.2	126.2	142.8
1976	132.1	131.6	133.9	152.0
1977	139.8	139.5	140.9	165.1
1978	150.1	149.1	150.1	180.5
1979	162.8	162.3	159.7	200.7
1980(r)	177.4	178.9	170.2	228.3
1981	193.7	193.7	182.4	250.7

r - Revised.

Note: Gross National Product, Personal Consumption Expenditures and Producers' Durable Equipment values are "Implicit Price Deflators"; Metal-Working Machinery and Equipment values are "Producer Price Indices".

Source: U.S. Department of Commerce, "Business Statistics," 1977; "Survey of Current Business" (monthly). U.S. Department of Labor, Bureau of Labor Statistics.

Price deflators are used to express changes over a period of time in constant dollars. The implicit price deflator for GNP is a weighted average of the price indexes used to deflate the components of GNP. It is generally regarded as the best single measure of broad price movements in the economy as a whole.

GROSS NATIONAL PRODUCT AND GOVERNMENT RECEIPTS
Selected Years, 1929 to Date
(Values in Billions of Dollars)

Year	GNP	Total Gov't Receipts	Percent of GNP	Federal Gov't Receipts	Percent of GNP	State & Local Gov't Receipts	Percent of GNP
1929	$ 103.4	$ 11.3	10.9%	$ 3.8	3.7%	$ 7.6	7.4%
1938	85.0	15.0	17.7	6.5	7.7	9.3	10.9
1945	212.4	53.2	25.1	42.5	20.0	11.6	5.5
1950	286.5	69.0	24.1	50.0	17.5	21.3	7.4
1955	400.0	101.1	25.3	72.6	18.2	31.7	7.9
1960	506.5	139.5	27.5	96.1	19.0	49.9	9.9
1965	691.1	188.3	27.3	124.3	18.0	75.1	10.3
1970	992.7	302.8	30.5	191.9	19.3	135.4	13.6
1973	1,326.4	413.1	31.1	258.6	19.5	195.0	14.7
1974	1,434.2	455.2	31.7	287.8	20.1	211.4	14.7
1975	1,549.2	470.5	30.1	287.3	18.5	237.7	15.3
1976	1,718.0	538.4	31.3	331.8	19.3	267.8	15.6
1977	1,918.0	605.7	31.6	375.1	19.6	298.0	15.5
1978	2,156.1	681.6	31.6	431.5	20.0	327.4	15.2
1979	2,413.9	765.2	31.7	494.4	20.5	351.2	14.5
1980(r)	2,626.1	836.8	31.9	540.8	20.6	384.0	14.6
1981(p)	2,925.5	954.6	32.6	624.8	21.4	416.8	14.2

p - Preliminary. r - Revised.

Note: Federal grants-in-aid to State and local governments are reflected in State and local receipts. Total government receipts have been adjusted to eliminate this duplication.

Source: "Economic Report of the President," February, 1982, and earlier editions.

CORPORATE PROFITS AND TAX
Selected Years, 1929 to Date
(Billions of Dollars)

Year	Corporate Profits Before Taxes	Profits Tax Liability	Profits After Tax	Net Dividend Payments	Undistributed Profits
1929	$ 10.0	$ 1.4	$ 8.6	$ 5.8	$ 2.8
1938	4.0	1.0	2.9	3.2	0.2
1945	19.7	10.7	9.0	4.6	4.4
1950	42.6	17.9	24.7	8.8	15.9
1955	48.4	22.0	26.4	10.3	16.1
1960	48.5	22.7	25.8	12.9	13.0
1965	75.2	30.9	44.3	19.1	25.2
1970	71.5	34.5	37.0	22.9	14.1
1973	115.8	48.7	67.1	27.8	39.3
1974	126.9	52.4	74.5	31.0	43.6
1975	120.4	49.8	70.6	31.9	38.7
1976	155.9	63.8	92.2	37.9	54.7
1977	177.1	72.6	104.5	42.1	62.4
1978	203.6	83.0	120.6	34.3	86.3
1979	225.0	87.6	137.4	34.9	102.5
1980(r)	214.4	82.3	132.0	37.4	94.6
1981	209.1	77.7	131.4	47.0	84.3

r - Revised.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

THE FEDERAL BUDGET
Fiscal Years, 1930 to Date
(Billions of Dollars)

Year	Receipts	Outlay	Surplus or Deficit (−)
1930	$ 4.1	$ 3.3	$ 0.7
1931	3.1	3.6	−0.5
1932	1.9	4.7	−2.7
1933	2.0	4.6	−2.6
1934	3.0	6.6	−3.6
1935	3.7	6.5	−2.8
1936	4.0	8.4	−4.4
1937	5.0	7.7	−2.8
1938	5.6	6.8	−1.2
1939	5.0	8.8	−3.9
1940	6.4	9.5	−3.1
1941	8.6	13.6	−5.0
1942	14.4	35.1	−20.8
1943	23.6	78.5	−54.9
1944	44.3	91.3	−47.0
1945	45.2	92.7	−47.5
1946	39.3	55.2	−15.9
1947	38.4	34.5	3.9
1948	41.8	29.8	12.0
1949	39.4	38.8	0.6
1950	39.5	42.6	−3.1
1951	51.6	45.5	6.1
1952	66.2	67.7	−1.5
1953	69.6	76.1	−6.5
1954	69.7	70.9	−1.2
1955	65.5	68.5	−3.0
1956	74.5	70.5	4.1
1957	80.0	76.7	3.2
1958	79.6	82.6	−2.9
1959	79.2	92.1	−12.9
1960	$ 92.5	$ 92.2	$ 0.3
1961	94.4	97.8	−3.4
1962	99.7	106.8	−7.1
1963	106.6	111.3	−4.8
1964	112.7	118.6	−5.9
1965	116.8	118.4	−1.6
1966	130.9	134.7	−3.8
1967(r)	148.9	157.6	−8.7
1968(r)	153.0	178.1	−25.2
1969(r)	186.9	183.6	3.2
1970(r)	192.8	195.7	−2.8
1971(r)	187.1	210.2	−23.0
1972(r)	207.3	230.7	23.4
1973(r)	230.8	245.6	−14.8
1974(r)	263.2	267.9	−4.7
1975(r)	279.1	324.2	−45.2
1976(r)	298.1	364.5	−66.4
Tr. Qtr.(r)	81.2	94.2	−13.0
1977(r)	355.6	400.5	−44.9
1978(r)	399.6	448.4	−48.8
1979(r)	463.3	491.0	−27.7
1980(r)	517.1	576.7	−59.6
1981(r)	599.3	657.2	−57.9
1982(E)	626.8	725.3	−98.6
1983(E)	666.1	757.6	−91.5

E - Estimate. r - Revised.

Tr. Qtr.—Transition Quarter: Beginning with the 1977 Federal Budget, the fiscal year runs from October 1 through September 30. To facilitate the conversion, a three-month transition period was provided between fiscal years 1976 and 1977.

Note: 1930 to 1939: Administrative Budget: 1940 to 1953: Consolidated Cash Statement: 1954 to Date: Unified Budget.

Source: Economic Report of the President, February 1982 and earlier editions.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT

1959 to Date

(Values in Billions of Current Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1959	$ 487.9	$ 45.9	9.4%	$ 28.3	5.8%
1960	506.5	48.5	9.6	29.7	5.9
1961	524.6	48.0	9.1	28.9	5.5
1962	565.0	52.2	9.2	32.1	5.7
1963	596.7	54.8	9.2	34.4	5.8
1964	637.7	61.0	9.6	38.7	6.1
1965	691.1	72.7	10.5	45.8	6.6
1966	756.0	83.1	11.0	53.0	7.0
1967	799.6	83.9	10.5	53.7	6.7
1968	873.4	90.6	10.4	58.2	6.7
1969	994.0	101.3	10.2	64.6	6.5
1970	992.7	103.9	10.5	65.1	6.6
1971	1,077.6	107.9	10.0	67.4	6.3
1972	1,185.9	121.0	10.2	76.8	6.5
1973	1,326.4	143.3	10.8	92.3	7.0
1974	1,434.2	156.6	10.9	100.6	7.0
1975	1,549.2	157.7	10.2	102.3	6.6
1976	1,718.0	174.1	10.1	115.2	6.7
1977	1,918.0	205.5	10.7	140.9	7.3
1978	2,156.1	242.0	11.2	163.3	7.6
1979	2,413.9	279.7	11.6	183.4	7.6
1980	2,626.1	296.0	11.3	187.1	7.1
1981	2,925.5	328.9	11.2	203.1	6.9

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

Gross private fixed nonresidential domestic investment includes capital expenditures by the domestic business sector for (1) new and replacement construction (e.g., buildings, stores, and warehouses) and (2) producers' durable equipment. Expenditures for producers' durable equipment include the new and replacement purchase of automobiles, trucks, various types of machinery, and other equipment used by the private sector in the production of goods and services.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT IN CONSTANT DOLLARS

1948 to Date

(Values in Billions of 1972 Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1948	$ 489.8	$ 51.1	10.4%	$ 32.6	6.6%
1949	492.2	46.0	9.3	28.1	5.7
1950	534.8	50.0	9.3	30.8	5.8
1951	579.4	52.9	9.1	32.2	5.6
1952	600.8	52.1	8.7	31.5	5.2
1953	623.6	56.3	9.0	33.7	5.4
1954	616.1	55.4	9.0	31.8	5.2
1955	657.5	61.3	9.3	35.9	5.5
1956	671.6	65.4	9.7	37.0	5.5
1957	683.8	66.2	9.7	37.8	5.5
1958	680.9	59.3	8.7	32.5	4.8
1959	721.7	63.6	8.8	36.2	5.0
1960	737.2	66.9	9.1	37.4	5.1
1961	756.6	66.7	8.8	36.5	4.8
1962	800.3	72.0	9.0	40.4	5.0
1963	832.5	75.1	9.0	43.1	5.2
1964	876.4	82.7	9.4	48.3	5.5
1965	929.3	97.4	10.5	56.8	6.1
1966	984.8	108.0	11.0	64.5	6.5
1967	1,011.4	105.6	10.4	63.6	6.2
1968	1,058.1	109.5	10.3	66.8	6.3
1969	1,087.6	116.8	10.7	71.8	6.6
1970	1,085.6	113.8	10.5	69.9	6.4
1971	1,122.4	112.2	9.2	69.3	5.7
1972	1,185.9	121.0	10.2	76.9	6.5
1973	1,255.0	138.1	11.0	90.7	7.2
1974	1,248.0	135.7	10.9	92.1	7.4
1975	1,233.9	119.3	9.7	81.1	6.6
1976	1,300.4	125.6	9.7	86.1	6.6
1977	1,371.7	140.6	10.3	100.0	7.3
1978	1,436.9	153.4	10.7	108.8	7.6
1979	1,483.0	163.3	11.0	114.8	7.7
1980	1,480.7	158.4	10.7	110.0	7.4
1981	1,510.3	162.4	10.8	111.4	7.4

Sources: U.S. Department of Commerce, and "Survey of Current Business" (monthly).

U.S. BALANCE OF TRADE
for Selected Years, 1960 to Date

	All Merchandise Billions of Dollars			Machine Tools and Parts Millions of Dollars		
Year	Exports	Imports	Net Balance	Exports	Imports	Net Balance
1960	$ 19.7	$ 14.8	$ 4.9	$ 192.5	$ 35.7	$ 156.8
1964	25.5	18.7	6.8	300.8	45.6	255.2
1965	26.5	21.5	5.0	287.2	68.9	218.3
1966	29.3	25.5	3.8	273.6	137.4	136.2
1967	30.7	26.9	3.8	294.5	203.7	90.8
1968	33.6	33.0	.6	286.0	191.3	94.7
1969	36.4	35.8	.6	323.5	182.5	140.9
1970	42.0	39.8	2.2	403.9	158.5	245.4
1971	42.8	45.5	−2.7	351.0	109.6	241.4
1972	48.8	55.8	−7.0	332.1	141.8	190.3
1973	71.4	70.4	1.0	443.0	211.6	231.4
1974	98.3	103.7	−5.4	566.5	330.3	236.2
1975	107.1	98.0	9.1	705.9	382.4	323.5
1976	114.4	123.4	−9.0	682.8	383.3	299.5
1977	119.7	150.6	−30.9	579.6	482.2	97.4
1978	142.0	175.8	−33.8	738.6	832.4	−93.7
1979(r)	176.9	208.9	−32.0	878.6	1,269.5	−390.9
1980(r)	218.2	245.9	−27.7	1,099.2	1,556.9	−457.7
1981(p)	229.8	260.3	−30.5	1,445.6	1,712.9	−267.3

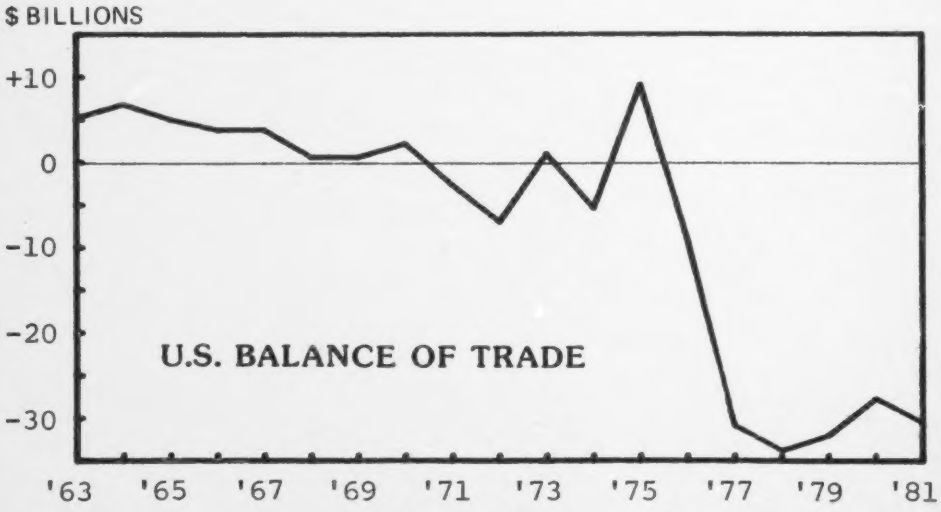
p - Preliminary. r - Revised.

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metal working machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Individual items may not add to totals due to rounding.

Source: All merchandise: U.S. Department of Commerce, "Survey of Current Business," (monthly); Machine Tools: U.S. Bureau of the Census, "EM 522" and "IM 146".

For details on how the values in the above table are computed, see the text introduction to Chapter 5.



VALUE OF U.S. DIRECT FOREIGN INVESTMENTS

Book Value at Year End

(Millions of U.S. Dollars)

	1975	1976	1977	1978	1979(r)	1980(p)
World:						
Total All Industries	$124,212	$136,396	$149,843	$167,806	$186,760	$213,468
Manufacturing	55,886	61,161	66,033	74,082	78,640	89,063
Canada:						
Total All Industries	31,038	33,932	35,200	37,071	40,243	44,640
Manufacturing	14,691	15,965	16,696	17,477	17,392	18,802
United Kingdom:						
Total All Industries	13,927	15,137	17,434	20,416	23,539	28,099
Manufacturing	7,555	7,734	8,849	9,990	11,425	14,047
European Economic Community:						
Total All Industries	25,074	26,445	30,499	34,812	42,142	48,489
Manufacturing	15,236	16,583	18,898	22,160	24,314	27,429
Other Western Europe:						
Total All Industries	10,532	13,556	12,997	14,325	16,941	19,098
Manufacturing	3,222	4,472	3,925	4,155	3,663	3,949
Japan:						
Total All Industries	3,339	3,797	4,143	4,972	6,208	6,274
Manufacturing	1,557	1,691	1,903	2,309	2,775	2,990
Australia, New Zealand, & South Africa:						
Total All Industries	7,013	7,530	7,952	8,876	9,595	10,484
Manufacturing	3,165	3,322	3,438	3,767	3,948	4,182
Latin America:						
Total All Industries	22,101	23,934	28,110	32,662	35,056	38,275
Manufacturing	8,562	9,275	10,063	11,712	12,410	14,489
Other Areas:						
Total All Industries	11,188	12,063	13,513	14,672	13,036	18,109
Manufacturing	1,898	2,121	2,261	2,512	2,713	3,175

p - Preliminary. r - Revised.

Source: U.S. Department of Commerce, "Survey of Current Business," (August).

Direct foreign investments include purchases and sales of equity interest in foreign enterprises and captial movements between U.S. corporations and their foreign affiliates.

ESTIMATES OF CAPITAL EXPENDITURES* BY MAJORITY-OWNED FOREIGN AFFILIATES OF U.S. COMPANIES, BY SELECTED COUNTRY OR AREA

(Millions of U.S. Dollars)

	Actual						Projection	
	1975	1976	1977(r)	1978(r)	1979(r)	1980(r)	1981(r)	1982
WORLD								
Total Manufacturing	$11,242	$11,013	$10,522	$11,959	$15,419	$19,540	$19,494	$21,355
Mchy., Except Elec.	2,798	2,660	2,968	3,630	4,749	5,589	4,754	5,290
CANADA								
Total Manufacturing	2,094	2,312	2,275	2,405	2,776	3,728	3,872	4,069
Mchy., Except Elec.	337	383	283	340	403	499	590	771
LATIN AMERICA								
Total Manufacturing	1,356	1,568	1,355	1,491	1,957	2,760	3,366	3,878
Mchy., Except Elec.	176	236	191	290	257	411	376	390
EUROPE								
Total Manufacturing	6,500	6,013	5,875	6,841	9,224	11,127	10,177	10,947
Mchy., Except Elec.	1,942	1,729	2,164	2,638	3,694	4,099	3,211	3,390
UNITED KINGDOM								
Total Manufacturing	1,564	1,513	1,447	1,780	2,596	3,005	2,726	2,970
Mchy., Except Elec.	574	516	455	527	834	784	750	650
FRANCE								
Total Manufacturing	1,074	829	1,041	1,072	1,273	1,582	1,181	1,376
Mchy., Except Elec.	423	326	571	620	790	977	649	750
FEDERAL REP. OF GERMANY								
Total Manufacturing	1,485	1,498	1,495	2,122	2,826	3,233	2,619	2,638
Mchy., Except Elec.	436	426	571	828	1,137	1,174	927	939
ITALY								
Total Manufacturing	613	506	418	522	634	870	816	935
Mchy., Except Elec.	259	214	D	D	D	D	D	D
ASIA AND PACIFIC								
Total Manufacturing	801	688	586	718	919	1,281	1,266	1,507
Mchy., Except Elec.	27(a)	26(a)	22(a)	331	355	34(a)	48(a)	64(a)
JAPAN								
Total Manufacturing	512	423	325	401	462	707	642	800
Mchy., Except Elec.	D	D	D	314	337	D	D	D
SOUTH AFRICA								
Total Manufactureing	92	92	67	61	87	117	153	228
Mchy., Except Elec.	D	D	D	8	11	18	24	31
AUSTRALIA								
Total Manufacturing	299	261	314	375	381	453	573	610
Mchy., Except Elec.	60	47	18	21	28	D	D	45

D - Withheld to avoid disclosure. r - Revised.

(a) Excludes Japan.

* "Capital expenditures" previously were referred to as "property, plant, and equipment expenditures." They represent gross outlays charged to capital accounts to acquire, add to, or improve real property, plant, and equipment. Sales or other dispositions of fixed assets are not netted against these outlays.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

EXPENDITURES ON NEW PLANT AND EQUIPMENT
Major Industries, Selected Years, 1960 to Date
(Billions of Dollars)

Year	All Industries	Total Manufacturing Industries	Durable Goods Industries	Electrical Machinery and Equipment	Non-electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment
1960	$ 48.63	$ 16.36	$ 8.28	$ 1.02	$ 1.21	$1.48	$0.46
1965	70.44	25.41	13.49	1.68	2.24	3.00	0.74
1967	83.42	32.25	17.82	3.13	3.02	2.85	1.59
1968	88.45	32.33	17.93	3.17	2.90	2.67	1.57
1969	99.53	36.27	19.97	3.27	3.63	2.99	1.81
1970	105.61	36.99	19.80	3.49	3.79	3.05	1.61
1971	108.52	33.60	16.78	3.04	3.15	2.42	1.13
1972	120.25	35.42	18.22	2.83	3.24	3.01	1.40
1973	137.69	42.37	22.74	3.50	3.97	3.83	1.83
1974	156.98	53.21	27.44	3.85	5.22	4.31	2.56
1975	157.71	54.92	26.33	3.14	4.96	3.35	2.57
1976	171.45	59.94	28.48	3.65	5.52	3.62	2.77
1977	198.08	69.23	34.05	4.68	6.59	5.83	3.22
1978	231.24	79.72	40.44	5.69	7.21	7.22	4.79
1979	270.45	98.68	51.07	7.28	10.52	8.31	7.01
1980	295.63	115.81	58.91	9.59	11.59	9.06	9.10
1981(r)	321.49	126.79	61.84	10.31	13.22	10.08	8.31
1982 E	345.11	136.81	67.24	12.60	14.91	9.49	9.10

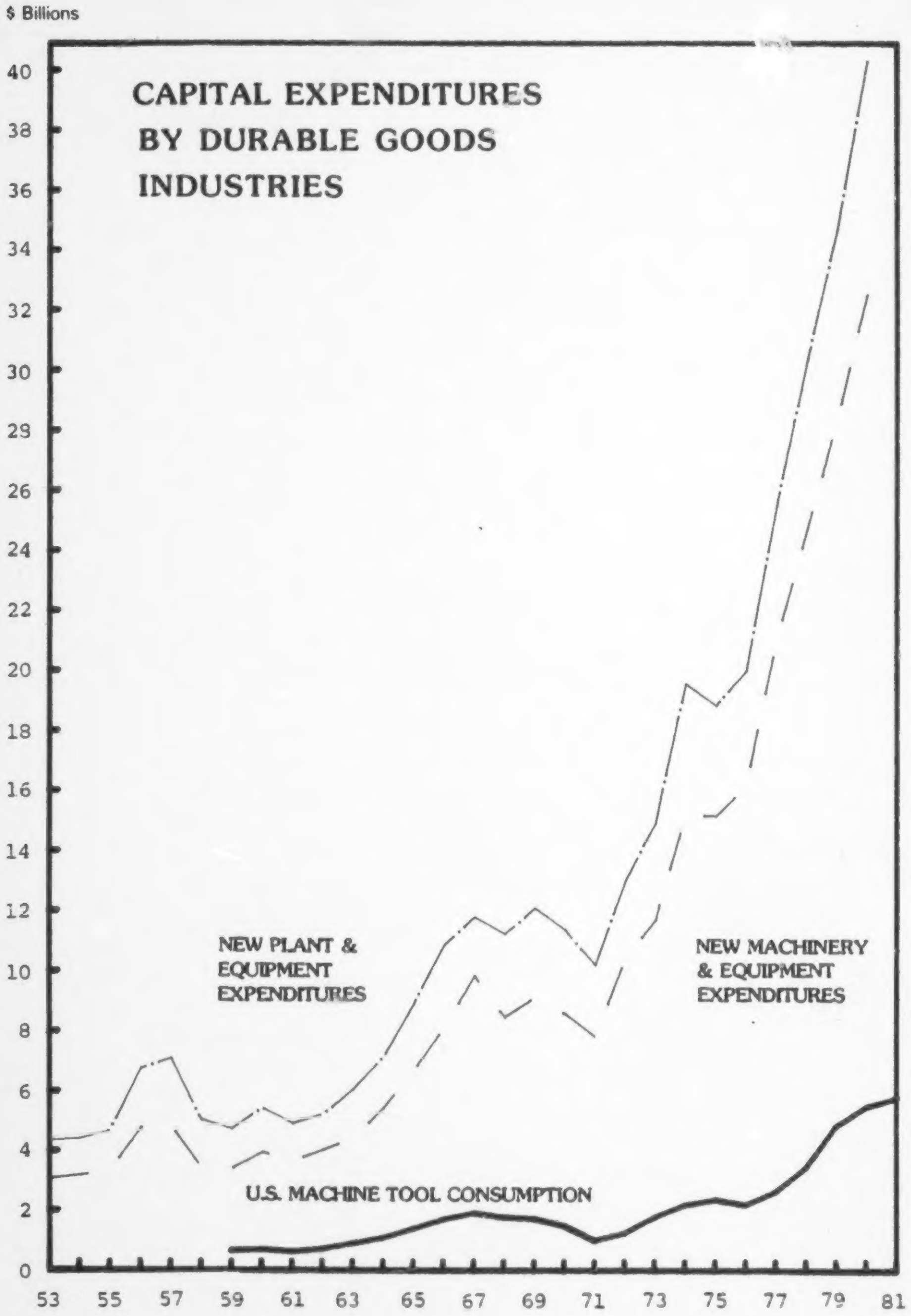
E - Estimate. r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business," (monthly). Estimate, "Survey of Current Business," (March).

NEW PLANT AND EQUIPMENT PROJECTS
Starts During Year and Carry-Over at Year End, 1965 to Date
(Billions of Dollars)

	Total Manufacturing		Durables		Electrical Machinery		Nonelectrical Machinery		Transportation Equipment		Public Utilities	
Year	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over
1965	$31.12	$20.02	$17.14	$11.00	$2.32	$1.64	$2.75	$1.04	$4.82	$3.07	$8.82	$7.67
1966	34.26	22.90	20.03	13.80	3.47	2.59	3.26	1.40	4.78	3.24	10.07	9.91
1967	30.31	20.96	16.10	12.07	3.05	2.51	2.70	1.08	3.87	2.67	13.53	14.12
1968	33.81	22.44	18.43	12.57	2.91	2.26	2.81	.99	4.90	3.32	12.68	16.28
1969	39.80	25.97	21.65	14.25	4.59	3.58	3.82	1.18	4.86	3.38	14.85	19.43
1970	33.82	22.81	17.41	11.86	2.91	2.99	3.66	1.06	4.12	2.85	16.76	23.16
1971	31.78	20.99	15.86	10.93	2.35	2.31	2.98	.89	3.78	3.09	20.69	29.15
1972	38.97	24.54	19.30	12.01	2.63	2.10	3.39	1.04	4.74	3.42	29.77	42.65
1973	53.21	35.38	28.07	17.33	4.12	2.72	4.43	1.50	7.02	4.79	36.22	60.91
1974	61.24	43.41	31.07	21.59	3.55	2.42	6.20	2.47	7.11	5.03	47.72	88.79
1975	56.51	45.00	23.71	18.98	2.59	1.88	5.33	2.84	4.40	3.52	39.32	108.14
1976	59.38	44.44	29.80	20.30	4.27	2.49	6.20	3.52	6.64	3.77	28.09	113.86
1977	77.40	52.62	36.59	22.85	4.80	2.62	6.84	3.77	10.63	5.33	34.53	121.60
1978	88.16	61.05	46.20	28.62	6.27	3.20	7.71	4.27	15.62	8.94	38.74	130.39
1979	112.98	75.35	59.18	36.72	8.16	4.08	12.66	6.41	19.01	12.63	21.67	118.10
1980	123.32	85.16	57.67	36.92	10.25	5.11	10.72	5.81	16.50	11.42	43.69	130.16
1981	135.19	93.73	68.89	44.37	11.50	6.49	15.95	8.75	19.35	12.26	34.98	126.04

Source: U.S. Department of Commerce, "Survey of Current Business" (March).



Source: U.S. Bureau of the Census and NMTBA.

EXPENDITURES ON NEW PLANT AND EQUIPMENT BY DURABLE GOODS INDUSTRIES AND MACHINE TOOL CONSUMPTION

1953 to Date

Year	New Plant & Equipment Expenditures Billions of Dollars				U.S. Machine Tool Consumption (c) (Mil. Dollars)	Machine Tool Consumption As a % of		
	BEA (a)	Census (b)				BEA (a)	Census (b)	
	Total	Total	Plant	Equipment		Total	Total	Equipment
1953	$ 5.31	$ 4.26	$1.25	$ 3.01	NA	NA	NA	NA
1954	4.91	4.32	1.20	3.12	NA	NA	NA	NA
1955	5.41	4.59	1.28	3.31	NA	NA	NA	NA
1956	7.45	6.62	1.95	4.67	NA	NA	NA	NA
1957	7.84	6.94	2.20	4.74	NA	NA	NA	NA
1958	5.61	4.94	1.33	3.61	NA	NA	NA	NA
1959	6.73	4.64	1.29	3.35	$ 631.2	9.4%	13.6%	18.8%
1960	8.28	5.34	1.47	3.87	655.9	7.9	12.3	16.9
1961	7.42	4.81	1.21	3.60	589.7	7.9	12.3	16.4
1962	7.81	5.12(E)	1.17(E)	3.95(E)	688.7	8.8	13.5	17.4
1963	8.64	5.92	1.55	4.37	867.8	10.0	14.7	19.9
1964	10.99	6.95	1.64	5.31	1,046.8	9.5	15.1	19.7
1965	13.49	8.70	2.18	6.52	1,342.7	10.0	15.4	20.6
1966	17.23	10.61(E)	2.72(E)	7.89(E)	1,657.4	9.6	15.6	21.0
1967	17.82	11.52	1.92	9.60	1,853.3	10.4	16.1	19.3
1968	17.93	10.97	2.71	8.26	1,711.8	9.5	15.6	20.7
1969	19.97	11.81	2.90	8.91	1,666.8	8.3	14.1	18.7
1970	19.80	11.11	2.74	8.37	1,444.8	7.3	13.0	17.3
1971	16.78	9.96	2.34	7.62	957.0	5.7	9.6	12.6
1972	18.22	12.70	2.56	10.14	1,212.2	6.7	9.5	12.0
1973	22.74	14.58	3.15	11.43	1,730.3	7.6	11.9	15.1
1974	27.44	19.13	4.26	14.87	2,126.4	7.8	11.1	14.3
1975	26.33	18.42	3.60	14.82	2,300.1	8.7	12.5	15.5
1976	28.46	19.57	3.75	15.82	2,135.3	7.5	10.9	13.5
1977	34.05	24.93	4.41	20.52	2,562.5	7.5	10.3	12.5
1978	40.44	29.66	5.52	24.14	3,360.1	8.3	11.3	13.9
1979(r)	51.07	33.91	6.22	27.69	4,713.0	9.2	13.9	17.0
1980(r)	58.91	39.42	7.62	31.80	5,345.9	9.1	13.6	16.8
1981	61.84	NA	NA	NA	5,623.9	9.1	NA	NA

NA - Not Available. E - Estimate. r - Revised.

(a) Bureau of Economic Analysis: covers all establishments (Manufacturing and Nonmanufacturing) operated by Manufacturing companies.

(b) Bureau of the Census: covers all Manufacturing establishments.

(c) U.S. domestic machine tool shipments plus imports.

Source: Bureau of Economic Analysis, U.S. Department of Commerce, "Survey of Current Business"; Bureau of the Census, "Annual Survey of Manufactures", M(AS)-5, Expenditures for New Plant and New Equipment; U.S. Bureau of the Census, "FT 135" and earlier reports; and National Machine Tool Builders' Association.

The last three columns in the above table show the percentage of investment for machine tools has declined since the 1960's. The U.S. share of machine tool investment has declined even more because imports have increased their share of the U.S. machine tool market. See the table in the beginning of chapter 5 on machine tool imports as a percentage of U.S. consumption.

EXPENDITURES FOR NEW MACHINERY AND EQUIPMENT

By Major Machine Tool Consuming Industries, 1947 to Date

(Millions of Dollars)

Year	Durable Goods Industries	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles & Equipment (a)	Aircraft & Parts
1947	NA	$ 212.7	$ 312.5	$ 179.7	$ 75.5	$ 18.8
1948	NA	NA	NA	NA	NA	NA
1949	NA	167.8	214.5	133.5	147.9	27.2
1950	NA	223.9	213.0	145.4	216.0	S
1951	NA	246.0	348.5	192.7	290.5	79.7
1952	NA	238.9	342.5	215.9	270.5	77.9
1953	$ 3,010	288.9	404.1	258.8	406.9	83.4
1954	3,120	323.2	425.5	247.6	621.0	87.8
1955	3,309	335.0	440.6	262.3	484.9	115.7
1956	4,669	361.1	545.3	342.3	854.9	181.4
1957	4,740	398.2	553.6	348.4	581.0	209.7
1958	3,605	316.8	487.0	311.1	271.0	129.2
1959	3,350	357.4	399.6	375.2	310.5	128.3
1960	3,866	360.4	435.1	449.0	371.0	124.4
1961	3,600	314.3	416.6	424.0	319.4	149.7
1962	3,946	390.2	447.8	476.4	366.4	189.4
1963	4,366	460.1	612.1	525.9	510.4	191.8
1964	5,306	549.4	713.3	568.2	712.0	204.6
1965	6,520	612.0	960.3	810.5	889.9	206.3
1966	7,889	725.6	1,157.2	1,019.6	893.9	414.7
1967	9,595	834.2	1,361.5	1,087.9	643.0	546.6
1968	8,256	799.5	1,299.8	1,061.3	632.0	463.8
1969	8,905	951.9	1,449.7	1,239.2	781.2	479.0
1970	8,365	872.0	1,377.3	1,134.6	731.7	292.9
1971	7,619	808.6	1,292.7	1,081.1	620.4	197.5
1972	10,139	1,030.7	1,478.2	1,123.4	1,921.3	139.8
1973	11,432	1,345.4	1,791.2	1,567.9	1,625.3	197.6
1974	14,868	1,470.4	2,456.8	1,899.9	2,087.5	227.6
1975	14,821	1,628.9	2,571.6	1,519.1	1,653.6	286.7
1976	15,822	1,724.8	2,611.1	1,816.5	1,908.1	350.6
1977	20,525	2,280.8	3,502.5	2,360.2	3,195.4	417.5
1978	24,142	2,494.4	4,427.7	2,937.9	3,968.6	575.1
1979	27,689	2,741.6	5,326.0	3,650.3	4,243.4	936.4
1980	31,803	3,219.8	6,086.1	4,780.1	4,752.6	1,262.7

NA - Not Available.   S - Estimate did not meet publication standards.

(a) Beginning in 1972, expenditures for special automotive tools (such as dies, die sets, jigs, fixtures, etc.) are included as capital expenditures. For transition information, special tooling expenditures amount to $1.2 billion for 1972 and $840 million for 1973.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures, M(AS)-5, Expenditures for New Plant and New Equipment".

CAPITAL FORMATION IN MANUFACTURING INDUSTRIES
Selected Years, 1950 to Date
(Billions of Dollars)

Year	Purchases		Depreciation (a)		Net Investment (b)		Net value (c)	
	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment
In Current Dollars								
1950	$ 6.1	$ 4.3	$ 4.7	$ 3.0	$ 1.4	$ 1.3	$ 55.1	$ 26.4
1955	9.3	6.3	7.3	5.0	2.0	1.3	77.0	41.0
1960	10.8	7.8	10.0	7.3	.8	.5	95.6	54.7
1965	18.3	13.8	12.0	8.8	6.3	5.0	116.4	68.2
1969	23.8	17.4	17.3	12.9	6.5	4.5	175.7	103.7
1970	23.8	17.5	18.9	14.0	4.9	3.5	191.2	112.3
1971	22.5	16.6	20.3	14.9	2.2	1.7	201.3	117.7
1972	25.8	19.9	21.4	15.7	4.4	4.2	213.4	124.0
1973	29.0	22.4	23.0	16.7	6.0	5.7	236.1	136.0
1974	38.3	29.3	26.5	19.0	11.8	10.3	292.7	170.4
1975	39.8	31.6	31.6	23.3	8.2	8.3	319.3	198.2
1976	43.4	34.7	34.5	26.1	8.9	8.6	343.9	219.0
1977	51.2	41.8	38.5	29.5	12.7	12.3	387.3	248.8
1978	57.7	47.1	43.5	33.4	14.2	13.7	437.8	281.8
1979	67.3	55.1	49.8	38.3	17.5	16.8	498.3	321.8
1980(r)	71.7	58.0	57.7	44.7	14.0	13.3	572.5	377.9
1981	77.8	64.0	65.6	51.5	12.2	12.5	630.3	422.4
In 1972 Dollars								
1950	$12.4	$ 8.2	$ 9.5	$ 5.9	$ 2.9	$ 2.3	$106.4	$ 50.2
1955	16.6	10.2	12.2	8.2	4.4	2.0	127.1	64.6
1960	15.6	10.3	14.1	9.6	1.5	.7	140.4	71.9
1965(r)	24.5	17.3	15.9	11.1	8.6	6.2	158.1	84.8
1969	27.5	19.3	19.7	14.2	7.8	5.1	196.7	111.9
1970	25.9	18.5	20.4	14.8	5.5	3.7	202.2	115.8
1971	23.1	16.9	20.9	15.2	2.2	1.7	204.6	117.8
1972	25.8	19.9	21.4	15.7	4.4	4.2	209.2	122.2
1973	27.9	21.8	22.1	16.3	5.8	5.5	215.3	128.0
1974	33.4	26.3	23.0	17.1	10.4	9.2	225.9	137.4
1975	30.4	24.5	24.0	18.0	6.4	6.5	232.7	144.3
1976	31.6	25.3	25.0	19.0	6.6	6.3	239.7	151.1
1977	35.3	28.9	26.2	20.1	9.1	8.8	249.2	160.3
1978	37.1	30.7	27.6	21.5	9.5	9.2	259.1	169.9
1979(r)	40.4	33.8	29.2	23.0	11.2	10.8	270.7	181.1
1980(r)	39.4	32.8	30.8	24.6	8.6	8.2	279.7	189.8
1981	39.8	33.6	32.4	26.1	7.4	7.5	287.6	197.8

r - Revised.

(a) Straight-line depreciation.
(b) Represents the difference between the purchase and depreciation series.
(c) Represents net value in preceding year plus net investment based on straight-line depreciation for year shown.
(d) Total includes equipment and structures.

Source: U.S. Bureau of Economic Analysis.

Data refer to privately owned manufacturing industries and are based on the fixed capital formation components of the gross national product. Stocks are as of end of year; investment and depreciation are annual totals.

CAPITAL APPROPRIATIONS AND BACKLOG OF UNSPENT APPROPRIATIONS (a)

By Selected Industry Groups, 1960 to Date

	All Manufacturing		Durables		Non-Electrical Machinery	
Year	Approp.	Backlog	Approp.	Backlog	Approp.	Backlog
In current dollars (billions)						
1960	$ 10.5	$ 8.4	$ 4.5	$ 4.6	$ 0.7	$0.9
1961	10.1	8.1	4.0	4.1	0.8	1.0
1962	11.7	8.5	5.4	4.5	0.8	0.9
1963	13.3	10.5	6.4	5.6	0.9	1.0
1964	17.9	14.0	8.7	7.2	1.4	1.1
1965	22.3	17.9	11.6	9.4	2.1	1.3
1966	25.4	20.2	14.0	11.4	2.8	1.5
1967	23.9	19.9	12.0	11.0	2.5	1.4
1968	24.8	20.9	12.6	11.5	2.4	1.3
1969	29.5	23.4	15.0	12.4	3.0	1.3
1970	25.3	20.9	12.4	10.8	3.1	1.2
1971	23.1	18.9	11.2	9.4	2.7	1.3
1972	28.8	23.3	14.1	11.8	3.2	1.8
1973	42.9	37.1	21.6	18.7	4.3	2.6
1974	53.7	49.8	24.9	22.7	5.8	3.8
1975	45.0	46.4	16.2	18.1	3.7	3.5
1976	50.0	47.5	22.4	21.0	5.0	4.0
1977	63.4	56.5	26.6	24.6	5.1	4.2
1978	67.2	63.4	33.1	31.1	6.3	5.0
1979	88.5	76.7*	43.3	39.0*	10.2	7.0*
1980(r)	104.6	90.7*	44.3	40.8*	9.4	6.5*
1981(p)	107.0	92.2*	42.1	39.9*	12.7	8.6*
In constant 1972 dollars (billions)						
1960	$14.6	$14.2	$ 6.0	$ 7.9	$1.0	$1.3
1961	14.2	13.8	5.4	7.2	1.1	1.4
1962	16.1	14.4	7.3	7.8	1.1	1.4
1963	18.2	17.1	8.5	9.2	1.2	1.4
1964	24.3	21.8	11.6	11.3	1.8	1.6
1965	29.6	27.1	15.2	14.3	2.7	1.8
1966	32.8	30.0	17.7	16.8	3.5	2.1
1967	30.0	29.6	14.8	16.3	3.1	1.9
1968	29.6	30.8	14.9	16.9	2.8	1.8
1969	33.6	33.7	17.0	17.9	3.4	1.8
1970	27.5	31.0	13.5	16.2	3.4	1.8
1971	23.9	28.9	11.5	14.8	2.8	1.9
1972	28.8	33.3	14.1	17.2	3.2	2.3
1973	41.6	46.7	21.0	23.9	4.1	3.1
1974	47.4	58.0	22.2	27.5	5.1	4.2
1975	34.6	55.3	12.6	23.9	2.9	3.9
1976	36.5	56.1	16.4	26.1	3.7	4.3
1977	43.7	62.3	18.5	28.6	3.6	4.4
1978	43.2	66.8	21.3	32.8	4.1	4.9
1979	52.5	74.7*	26.0	37.6*	6.2	6.1*
1980(r)	58.3	82.5*	24.8	38.6*	5.3	5.9*
1981(p)	54.4	83.3*	22.0	38.2*	6.6	7.0*

p - Preliminary estimate. r - Revised. * - Seasonally adjusted.

(a) These data are the results of The Conference Board's survey of the 1,000 largest U.S. manufacturers and pertain only to their domestic capital investment. This series is copyrighted by The Conference Board and can be reproduced only with their written permission.

Source: The Conference Board.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Selected Industry Groups, 1978 to Date

(Millions of Dollars)

Industry Group	1978 Total	1978 Machinery & Equipment	1979 Total	1979 Machinery & Equipment	1980 Total	1980 Machinery & Equipment
All Operating Manufacturing Establishments	$478,837	$359,725	$522,560	$393,645	$573,570	$433,995
Fabricated Metal Products	28,059	20,771	30,811	22,943	33,721	25,369
Nonelectrical Machinery	40,899	29,521	46,263	33,471	52,662	38,324
Construction & Related Machinery	7,875	5,302	8,720	5,911	9,864	6,747
Metalworking Machinery	5,191	3,968	5,865	4,451	6,546	4,996
Metal Cutting Machine Tools	1,115	785	1,333	961	1,453	1,036
Metal Forming Machine Tools	488	350	566	406	612	444
Other Metalworking Machinery	3,588	2,833	3,966	3,084	4,481	3,516
Special Industrial Machinery	2,992	2,100	3,130	2,146	3,458	2,395
General Industrial Machinery	5,983	4,401	6,544	4,828	7,378	5,490
Office & Computing Machines	5,380	3,825	6,750	4,742	8,319	5,895
Other Nonelectrical Machinery	13,478	9,923	15,254	11,393	17,097	12,801
Electrical Machinery	26,648	18,860	30,340	21,626	35,278	25,340
Transportation Equipment	35,453	25,189	40,328	28,762	45,636	32,814
Instruments & Related Products	9,332	6,192	10,377	6,897	11,825	7,941

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, 1977 "Census of Manufactures", "Annual Survey of Manufactures".

The tables appearing on this and the following page are included to provide some measure of the total stock of fixed assets in selected machine tool consuming industries. However, neither table presents an ideal measurement. Data in the "Gross Book Value" table include the total original cost of assets until the time they are fully depreciated. These are available only on an annual basis. The "Net Value" table is more current and is available on a quarterly basis but includes land, mineral rights, depletion, and amortization.

The data in the tables are not directly comparable due to these definitional differences in sample coverage and statistical methodology. For additional information on the gross book value of depreciable assets in the machine tool industry, see chapter 8.

NET VALUE OF PROPERTY, PLANT AND EQUIPMENT (a)
Selected Industry Groups, 1974 to Date
(Millions of Dollars)

Year: Qtr.	All Manufacturing	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Transportation Equipment	Instruments and Related Products
1974:1	$237,598	$ 9,688	$16,556	$15,520	$19,074	$ 5,024
:2	245,053	10,048	17,198	15,796	19,582	5,319
:3	252,095	9,914	17,915	16,118	20,283	5,503
:4	262,142	10,428	21,457	14,620	20,617	6,095
1975:1	266,114	10,487	21,884	14,854	21,529	6,480
:2	273,796	10,865	22,541	15,035	22,382	6,645
:3	278,565	10,751	22,854	15,157	22,557	6,659
:4	283,689	10,816	23,018	14,977	22,515	6,919
1976:1	287,362	11,160	23,342	15,001	21,669	6,938
:2	293,435	11,149	23,786	15,155	21,673	6,990
:3	300,895	11,363	23,967	15,246	21,924	7,138
:4	307,360	11,469	24,745	15,452	21,927	7,210
1977:1	310,962	11,443	25,206	15,780	21,808	7,240
:2	318,941	11,797	25,940	15,735	22,513	7,417
:3	327,798	12,144	26,635	16,366	23,317	7,406
:4	339,809	12,286	27,805	17,051	24,369	7,555
1978:1	348,397	12,301	28,893	17,063	24,874	7,828
:2	357,773	12,720	29,803	17,551	26,074	7,820
:3	367,736	13,450	30,849	18,179	27,331	7,896
:4	382,953	14,208	32,168	19,175	28,883	8,162
1979:1	392,903	14,958	33,624	19,625	29,653	8,343
:2	404,433	15,494	35,348	20,278	30,962	8,631
:3	418,178	15,885	37,151	20,881	32,488	8,925
:4	441,415	15,597	39,093	22,222	34,130	9,447
1980:1	453,505	15,939	40,483	22,913	35,659	9,832
:2	466,697	16,379	41,771	23,785	37,065	10,122
:3	485,315	16,644	43,544	24,893	38,458	10,557
:4(r)	515,022	18,607	46,718	26,186	39,861	10,761
1981:1	529,406	19,276	48,044	26,977	40,915	11,214
:2	544,288	19,799	49,887	27,985	41,966	11,613
:3	562,263	19,945	51,795	29,048	43,319	11,958
:4(p)	582,084	20,319	54,567	30,711	44,134	12,550

r - Revised. p - Preliminary.

(a) Depreciable fixed assets including construction in progress, land and mineral rights less accumulated depreciation, depletion and amortization.

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

Net Value of Property, Plant and Equipment data are collected quarterly by extensive survey of manufacturing, mining and trade corporations. Each corporation is required to show gross receipts by source industry and is classified in the particular industry which accounts for the largest share of gross receipts. Please note that these procedures may lead to a conglomerate corporation being assigned to an industry from which only a small proportion of its receipts are obtained. For this reason, the above data should be used with caution.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Short-term Rates, 1967 to Date

(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1967	5.80%	6.13%	5.95%	5.95%	5.96%
1968	6.68	6.36	6.84	6.89	6.61
1969	8.21	7.32	7.86	8.82	8.83
1970	8.48	8.86	8.49	8.50	8.07
1971(a)	6.48	6.59	6.01	6.51	6.18
1972	5.82	5.52	5.59	5.84	6.33
1973	8.30	6.52	7.35	9.24	10.08
1974	11.28	9.91	11.15	12.40	11.64
1975	8.65	9.94	8.16	8.22	8.29
1976	7.52	7.54	7.44	7.80	7.28
1977	7.85	7.48	7.37	7.87	8.66
1978	9.84	8.95	9.01	9.97	11.44
1979	13.18	12.27	12.34	12.31	15.81
1980	15.17	15.67	17.75	11.56	15.7
1981	19.56	19.91	19.99	21.11	17.23

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .16% decrease from 6.75% to 6.59%.

Source: Federal Reserve Board.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Long-term Rates, 1967 to Date

(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1967	5.94%	5.84%	5.99%	5.90%	6.01%
1968	6.73	6.35	6.73	7.03	6.79
1969	8.01	6.64	7.87	8.66	8.86
1970	8.47	8.67	8.25	8.66	8.31
1971(a)	6.57	6.82	6.36	6.67	6.44
1972	6.12	5.64	5.87	6.31	6.67
1973	8.83	7.12	7.67	9.85	10.68
1974	11.70	10.16	11.41	13.06	12.16
1975	9.06	10.26	8.22	8.89	8.88
1976	7.99	8.02	8.02	8.45	7.48
1977	8.52	9.05	8.24	8.09	8.71
1978	10.11	9.19	9.67	10.20	11.38
1979	12.98	12.01	12.08	12.25	15.56
1980	15.32	15.79	18.37	12.06	15.07
1981	19.52	19.26	19.25	20.62	18.94

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .08% decrease from 6.90% to 6.82%.

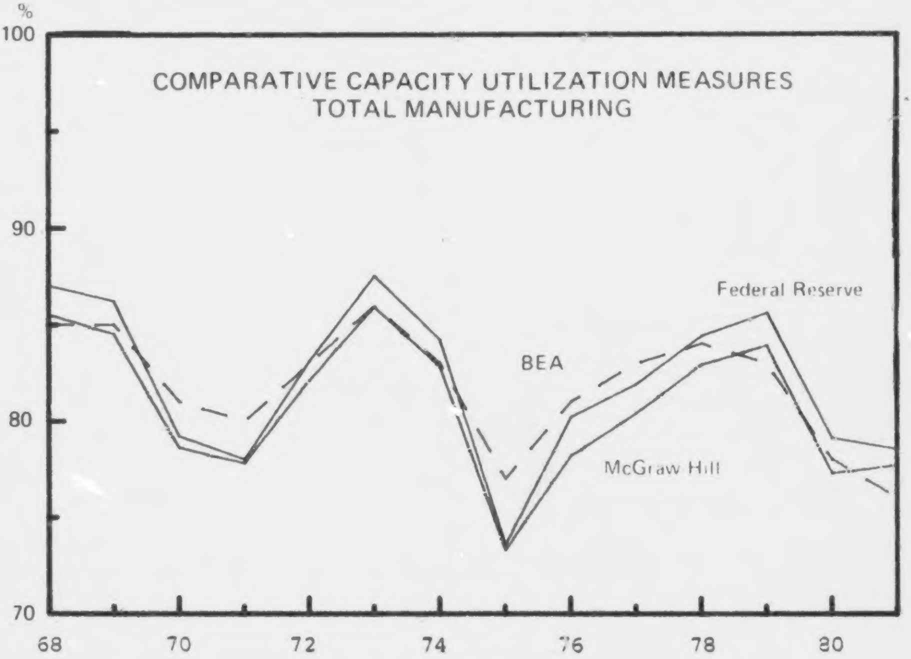
Source: Federal Reserve Board.

COMPARATIVE CAPACITY UTILIZATION MEASURES
Total Manufacturing, 1968 to Date

Year	Federal Reserve Board	Bureau of Economic Analysis	McGraw-Hill
1968	87.0%	85%	85.5%
1969	86.2	85	84.5
1970	79.2	81	78.6
1971	78.0	80	77.8
1972	83.1	83	82.1
1973	87.5	86	85.9
1974	84.2	83	82.8
1975	73.6	77	73.3
1976	80.2	81	78.2
1977	81.9	83	80.4
1978	84.4	84	82.9
1979	85.6	83	83.9
1980(r)	79.1	78	77.3
1981	78.5	76	77.7

Sources: Federal Reserve Board; U.S. Department of Commerce, Bureau of Economic Analysis; McGraw-Hill Publications Company.

For further explanation of "Capacity Utilization" see chapter introduction.



CAPACITY UTILIZATION IN MANUFACTURING
Bureau of Economic Analysis, Operating Rates
1965 to Date

	Total Mfg.	Total Durables	Electrical Machinery	Machinery, Except Electrical	Motor Vehicles	Aircraft	Advanced-Processed Goods (a)
1965	86%	88%	83%	95%	96%	79%	85%
1966	86	87	84	95	90	82	85
1967	84	83	78	91	87	82	83
1968	85	84	80	90	93	82	84
1969	85	84	80	92	90	77	84
1970	81	78	76	86	81	68	79
1971	80	78	76	81	92	65	80
1972	83	82	81	84	97	69	82
1973	86	85	82	87	100	69	84
1974	83	82	83	88	83	71	82
1975	77	76	73	83	83	65	77
1976	81	81	80	86	93	65	81
1977	83	84	82	89	99	68	83
1978	84	84	83	91	95	70	84
1979	83	83	82	91	84	76	82
1980	78	77	80	90	67	79	78
1981	76	75	76	89	63	75	76
1977 1st Qtr. (b)	83	84	81	87	106	69	84
2nd Qtr. (b)	84	86	84	89	104	71	84
3rd Qtr. (b)	82	82	82	90	93	66	82
4th Qtr. (b)	82	82	82	90	94	67	83
1978 1st Qtr. (b)	84	84	84	91	98	67	84
2nd Qtr. (b)	84	85	83	91	97	70	84
3rd Qtr. (b)	83	83	82	90	90	69	82
4th Qtr. (b)	84	85	82	92	96	72	84
1979 1st Qtr. (b)	84	85	84	92	96	74	84
2nd Qtr. (b)	83	84	82	92	89	75	83
3rd Qtr. (b)	82	82	82	91	78	77	81
4th Qtr. (b)	81	80	81	89	72	77	80
1980 1st Qtr. (b)	80	80	82	91	70	79	80
2nd Qtr. (b)	76	74	78	89	60	78	76
3rd Qtr. (b)	76	75	79	89	67	78	77
4th Qtr. (b)	78	78	79	90	70	80	78
1981 1st Qtr.	78	77	78	89	69	77	78
2nd Qtr.	78	77	76	90	73	75	78
3rd Qtr.	76	74	76	89	60	75	76
4th Qtr.	72	70	74	88	51	73	73

(a) Advanced-Processed Goods include producers of furniture, electrical machinery, machinery except electrical, motor vehicles, aircraft, other transportation equipment, instruments, miscellaneous manufactures, food including beverage, tobacco, apparel, printing and publishing, chemicals (at ½ weight), and leather.

(b) Seasonally Adjusted.

Source: U.S. Department of Commerce, "Survey of Current Business", July 1974 and issues for March, June, September and December of later years.

CAPACITY UTILIZATION IN MANUFACTURING
McGraw-Hill, Operating Rates, Seasonally Adjusted
1966 to Date

Year	Total Mfg.	Total Durables	Metal-Working Industries	Fabricated Metals	Electrical Machinery	Machinery, except Electrical	Motor Vehicles and Parts
1966	89.1%	90.1%	91.6%	89.6%	92.0%	92.4%	92.8%
1967	85.4	84.9	86.6	86.6	86.3	87.3	79.3
1968	85.5	84.7	85.9	84.7	83.3	85.4	93.0
1969	84.5	84.0	84.3	81.4	78.0	87.9	94.3
1970	78.6	75.1	73.3	72.5	67.3	79.6	74.0
1971	77.8	73.5	71.5	69.8	65.2	72.2	93.9
1972	82.1	78.7	76.8	72.6	70.9	77.5	103.5
1973	85.9	84.7	83.2	78.6	79.8	84.1	104.8
1974	82.8	80.9	79.6	78.5	78.6	84.1	76.7
1975	73.3	69.4	69.2	71.7	64.6	72.3	64.6
1976	78.2	75.0	74.2	77.8	73.2	75.0	76.1
1977	80.4	78.2	78.1	78.5	78.1	77.0	87.0
1978	82.9	81.5	81.4	81.8	82.0	81.1	85.5
1979	83.9	83.0	83.6	84.8	84.1	85.6	78.5
1980	77.3	74.6	76.1	75.3	76.6	81.3	59.3
1981	77.7	75.3	75.6	77.8	79.7	80.6	62.7
1977 1st Qtr.	79.0	76.0	76.2	77.8	75.7	75.3	83.0
2nd Qtr.	80.3	78.0	77.7	78.3	77.7	76.3	87.0
3rd Qtr.	80.8	78.7	78.7	79.5	78.5	77.2	89.0
4th Qtr.	81.5	80.0	79.8	78.3	80.5	79.0	89.0
1978 1st Qtr.	81.3	79.2	79.7	79.7	80.5	79.8	82.2
2nd Qtr.	82.7	81.0	81.2	81.0	82.0	80.5	87.2
3rd Qtr.	83.3	82.2	82.0	82.7	82.7	81.8	85.0
4th Qtr.	84.2	83.5	82.8	83.8	82.7	82.5	87.7
1979 1st Qtr.	84.7	84.3	84.7	86.0	84.8	85.3	85.5
2nd Qtr.	84.0	83.5	84.0	85.5	84.0	85.7	81.8
3rd Qtr.	84.2	83.0	83.0	84.2	83.3	86.5	74.8
4th Qtr.	82.8	81.3	82.7	83.5	84.5	85.0	71.8
1980 1st Qtr.	82.3	80.8	81.5	81.9	82.9	86.2	65.3
2nd Qtr.	76.3	73.5	75.5	74.7	77.0	81.4	54.6
3rd Qtr.	73.7	70.0	72.5	70.1	72.8	78.4	54.2
4th Qtr.	76.9	74.2	74.9	74.3	73.7	79.2	63.0
1981 1st Qtr.(r)	78.6	76.2	75.8	79.7	79.0	81.4	60.9
2nd Qtr.	78.8	76.8	77.2	79.7	80.3	81.7	68.6
3rd Qtr.	78.8	76.5	76.7	78.8	81.0	82.0	64.7
4th Qtr.	74.6	71.5	72.6	73.0	78.4	77.1	56.7
1982 1st Qtr.	71.5	67.6	68.8	67.0	75.9	72.4	52.8

r - Revised.

Source: McGraw-Hill Publications Company.

INDUSTRIAL PRODUCTION INDEXES

Major and Selected Industry Groupings, 1960 to Date

1967 = 100 (Quantity of Output Basis)

Year	Total Industrial Production	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nonelectrical Machinery
1960	66.2	65.4	62.9	72.4	71.1	56.9
1961	66.7	65.6	61.8	71.1	69.4	55.4
1962	72.2	71.5	68.6	76.3	75.4	62.1
1963	76.5	75.8	73.1	82.3	77.8	66.3
1964	81.7	81.0	78.3	92.8	82.6	75.6
1965	89.8	89.7	89.0	102.1	90.8	85.0
1966	97.8	97.9	98.9	108.4	97.2	98.8
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	106.3	106.4	106.5	104.3	106.6	101.8
1969	111.1	111.0	110.6	113.8	107.9	109.3
1970	107.8	106.4	102.3	106.6	102.4	104.4
1971	109.6	108.2	102.4	100.2	103.5	100.2
1972	119.7	118.9	113.7	112.1	112.1	116.0
1973	129.8	129.8	127.1	126.7	124.7	133.7
1974	129.3	129.4	125.7	123.1	124.2	140.1
1975	117.8	116.3	109.3	96.4	109.9	125.1
1976	129.8	129.5	121.7	108.9	123.3	135.0
1977	137.1	137.1	129.5	110.2	130.9	144.8
1978(r)	146.1	146.7	139.7	119.9	141.6	153.6
1979	152.5	153.6	146.4	121.3	148.5	163.7
1980(r)	147.0	146.7	136.7	102.3	134.1	162.8
1981	151.0	150.4	140.5	107.9	136.4	171.2

r - Revised.

Source: Federal Reserve Board.

INDUSTRIAL PRODUCTION INDEXES

(Continued)

Year	Electrical Machinery	Transportation Equipment	Motor Vehicles and Parts	Aircraft and Parts	Instruments
1960	51.6	65.4	74.7	55.9	57.8
1961	54.8	61.5	65.5	58.3	57.2
1962	62.9	71.1	79.8	64.0	59.7
1963	64.7	78.0	88.3	68.8	66.3
1964	68.4	80.0	90.7	67.7	71.8
1965	81.7	95.1	115.9	71.9	82.6
1966	97.9	102.0	113.9	88.4	90.5
1967	100.0	100.0	100.0	100.0	100.0
1968	105.5	111.1	120.3	103.0	106.2
1969	111.9	108.4	116.5	97.3	115.0
1970	108.1	89.5	92.3	81.1	112.0
1971	107.7	97.9	118.6	67.7	109.5
1972	122.2	108.2	135.8	67.0	120.4
1973	143.1	118.3	148.8	75.1	137.7
1974	143.8	108.7	128.2	78.3	144.1
1975	116.5	97.4	111.1	73.3	132.3
1976	131.6	110.6	140.7	69.3	148.2
1977	141.9	121.1	159.7	69.6	159.1
1978	159.4	132.5	169.9	84.2	167.1
1979	175.0	135.4	159.9	100.0	174.9
1980(r)	172.8	116.9	119.0	106.1	171.1
1981	178.4	116.1	122.3	105.0	170.3

r - Revised.

Source: Federal Reserve Board.

PRODUCTIVITY IN MANUFACTURING (r)
Indexes, 1947 to Date
1977 = 100

	Productivity (a) (Output Per Hour of All Persons)	Constant Dollar Output	Hours (All Persons)	Compensation Per Hour		Unit Labor Costs
				Current	Real (b)	
1947	42.4	33.9	79.9	17.5	47.6	41.3
1948	45.1	35.9	79.4	19.5	49.2	43.3
1949	46.9	34.0	72.4	20.4	52.0	43.5
1950	79.5	38.7	78.2	21.5	54.1	43.4
1951	51.2	43.1	84.2	23.6	55.1	46.2
1952	52.1	44.5	85.4	25.2	57.4	48.3
1953	53.0	47.6	89.8	26.5	60.1	50.1
1954	53.8	44.2	82.1	27.7	62.6	51.6
1955	56.5	48.9	86.6	28.8	65.2	51.0
1956	56.1	49.3	87.9	30.7	68.3	54.7
1957	57.2	49.5	86.5	32.5	70.0	56.8
1958	57.0	45.3	79.4	33.9	71.1	59.6
1959	59.7	50.5	84.7	35.2	73.3	59.0
1960	60.1	50.7	84.4	36.7	75.1	61.1
1961	61.7	50.8	82.3	37.7	76.4	61.1
1962	64.4	55.1	85.6	39.2	78.5	60.9
1963	69.0	59.7	86.5	40.4	79.8	58.5
1964	72.4	64.0	88.4	42.0	82.0	58.1
1965	74.6	69.9	93.6	42.9	82.3	57.4
1966	75.4	75.2	99.7	44.8	83.6	59.4
1967	75.4	75.1	99.6	47.0	85.4	62.4
1968	78.1	79.2	101.4	50.4	87.8	64.6
1969	79.4	81.8	103.0	53.9	89.1	67.9
1970	79.2	77.1	97.3	57.6	89.9	72.7
1971	84.1	78.8	93.7	61.1	91.4	72.7
1972	88.3	86.3	97.8	64.4	93.3	72.9
1973	93.1	96.0	103.2	69.1	94.2	74.2
1974	90.9	92.0	101.2	76.4	93.9	84.1
1975	93.5	85.5	91.4	85.5	96.3	91.4
1976	97.7	93.7	95.9	92.4	98.3	94.6
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.9	105.4	104.4	108.2	100.5	107.3
1979	102.0	108.6	106.5	118.8	99.2	116.5
1980	101.7	103.6	101.9	131.6	96.8	129.4
1981	104.0	105.8	101.7	146.2	97.4	140.6
1st Quarter	103.9	106.7	102.7	141.1	97.1	135.8
2nd Quarter	104.8	107.4	102.5	144.8	97.9	138.2
3rd Quarter	105.0	107.3	102.2	148.0	97.3	141.0
4th Quarter	102.0	101.9	99.9	150.8	97.3	147.8
1982						
1st Quarter	100.7	98.1	97.4	154.7	99.0	153.5

r - Revised.

(a) The productivity index is obtained by dividing the constant dollar output index by the labor input (hours) index.

(b) Compensation per hour adjusted for changes in the Consumer Price Index.

Source: U.S. Bureau of Labor Statistics.

This table is based on output and compensation data published by the Commerce Department's Bureau of Economic Analysis. The indexes for manufacturing output, which are based on figures taken from Gross National Product components, vary from those for manufacturing production in the tables of industrial production indexes. The latter are generated independently by the Federal Reserve Board from their own survey and using their own methodology.

SELECTED LEADING BUSINESS CYCLE INDICATORS
1949 to Date (r)

		Selected Leading Indicators					
	Composite 12 Leading Indicators	Average Workweek, Mfg.	Layoff Rate, Mfg.	New Orders Consumer Goods	Orders for Plant & Equipment	Net Change in Inventories	Change in Sensitive Prices
	1967 = 100	Hours	Per 100 Employees	$ Billion	$ Billion	$ Billion Annual Rate	Percent
1949	50.8	39.1	2.9	$130.03	$ 32.46	$ −2.8	−1.0%
1950	58.4	40.5	1.3	179.34	52.79	11.5	1.8
1951	58.2	40.6	1.4	193.78	62.15	23.9	0.4
1952	59.6	40.7	1.4	190.70	53.24	8.8	−0.5
1953	60.3	40.5	1.6	196.17	51.05	−.1	0.2
1954	60.5	39.6	2.3	183.12	42.62	−12.4	−0.1
1955	69.0	40.7	1.5	234.96	58.15	6.8	1.0
1956	68.0	40.4	1.7	216.25	60.63	8.4	0.2
1957	65.8	39.8	2.1	205.54	52.31	−4.8	−0.5
1958	67.0	39.2	2.6	194.74	47.04	−4.9	0.3
1959	74.3	40.3	2.0	227.48	55.32	11.8	0.3
1960	71.0	39.7	2.4	214.81	54.60	−3.1	−0.7
1961	75.4	39.8	2.2	225.44	55.49	2.1	0.2
1962	79.3	40.4	2.0	241.15	60.54	6.7	−0.3
1963	84.1	40.5	1.8	259.00	65.95	7.5	0.0
1964	89.6	40.7	1.7	280.39	74.89	11.8	0.4
1965	95.1	41.2	1.4	308.24	81.99	13.0	0.2
1966	98.0	41.4	1.2	327.93	94.63	20.7	0.0
1967	100.0	40.6	1.4	323.14	87.23	10.4	−0.2
1968	106.8	40.7	1.2	346.36	115.03	8.9	0.2
1969	109.4	40.6	1.2	358.23	123.31	11.9	0.9
1970	104.4	39.8	1.8	327.13	105.32	0.0	0.4
1971	113.7	39.9	1.6	343.15	109.87	3.2	0.3
1972	124.9	40.5	1.1	387.93	121.93	11.5	0.8
1973	131.8	40.7	0.9	434.21	148.99	26.2	1.9
1974	122.1	40.0	1.5	396.34	149.01	6.5	2.5
1975	114.8	39.5	2.1	341.53	116.89	−20.3	0.1
1976	128.8	40.1	1.3	391.24	132.21	8.4	0.9
1977	136.4	40.3	1.1	432.97	146.23	13.1	0.5
1978	141.8	40.4	0.9	458.65	170.86	20.0	1.2
1979	140.1	40.2	1.1	450.53	180.50	11.1	2.0
1980(r)	131.2	39.7	1.7	404.73	165.59	−9.6	1.5
1981(p)	133.1	39.8	1.5	408.32	167.95	1.6	1.3
1981 1st Qtr.(p)	135.1	39.9	1.3	104.34	43.43	−7.6	2.8
2nd Qtr.(p)	136.1	40.2	1.2	106.83	42.39	2.2	2.0
3rd Qtr.(p)	133.2	39.8	1.4	103.54	41.60	9.8	0.6
4th Qtr.(p)	127.9	39.3	2.2	93.61	40.53	2.1	−0.2
1982 1st Qtr.(p)	124.8	38.6	NA	90.85	38.21	−21.1	−0.9

NA - Not Available. p - Preliminary. r - Revised.

Note: New orders, plant and equipment orders, and change in inventory data are based in 1972 dollars.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, "Business Conditions Digest" (monthly).

Twelve economic indicators normally precede changes in the business year. These are the "leading indicators", six of which are shown separately in the table together with the composite of the 12.

BUSINESS CYCLE REFERENCE DATES
1854 to Date

Trough		Peak		Expansion Duration (in Months) (a)
Dec.	1854	June	1857	30
Dec.	1858	Oct.	1860	22
June	1861	Apr.	1865	46(b)
Dec.	1867	June	1869	18
Dec.	1070	Oct.	1873	34
Mar.	1879	Mar.	1882	36
May	1885	Mar.	1887	22
Apr.	1888	July	1890	27
May	1891	Jan.	1893	20
June	1894	Dec.	1895	18
June	1897	June	1899	24
Dec.	1900	Sept.	1902	21
Aug.	1904	May	1907	33
June	1908	Jan.	1910	19
Jan.	1912	Jan.	1913	12
Dec.	1914	Aug.	1918	44(b)
Mar.	1919	Jan.	1920	10
July	1921	May	1923	22
July	1924	Oct.	1926	27
Nov.	1927	Aug.	1929	21
Mar.	1933	May	1937	50
June	1938	Feb.	1945	80(b)
Oct.	1945	Nov.	1948	37
Oct.	1949	July	1953	45(b)
May	1954	Aug.	1957	39
Apr.	1958	Apr.	1960	24
Feb.	1961	Dec.	1969	106(b)
Nov.	1970	Nov.	1973	36
Mar.	1975	Jan.	1980	58
July	1980	July	1981	12
Average Peacetime Cycles:				
25 cycles, 1854-1981				27
11 cycles, 1919-1981				31
6 cycles, 1945-1981				34

(a) Time period from trough to peak.

(b) Wartime expansions (Civil War, World War I and II, Korean War and Vietnam War.)

Source: National Bureau of Economic Research, Inc.

The historical business cycle turning dates, above, are those designated by the National Bureau of Economic Research, Inc. (NBER). They mark the approximate dates when, according to the NBER, aggregate economic activity reached its cyclical high (peak) or low (trough) levels.

MANUFACTURERS' INVENTORIES
Major Industry Groups, 1965 to Date
(Book Value in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Total Manufacturing	Durables	By Industry Group		By Capital Goods Industries	
			Primary Metals	Fabricated Metal Products	Nondefense	Defense
1965	$ 68.2	$ 42.3	$ 6.2	$ 5.7	NA	NA
1967	84.7	55.0	7.6	6.6	NA	NA
1968	90.6	58.9	7.5	7.4	$19.8	$ 7.2
1969	98.2	64.7	8.1	7.6	22.6	7.6
1970	101.7	66.8	9.0	7.8	24.6	4.9
1971	102.7	66.3	9.1	8.0	24.2	4.0
1972(r)	108.2	70.3	9.6	8.5	25.3	4.3
1973(r)	124.6	81.4	10.0	9.9	29.8	4.5
1974(r)	157.8	101.7	13.4	13.4	37.5	4.9
1975(r)	159.9	102.9	15.7	13.1	37.1	5.7
1976(r)	175.2	112.6	17.6	14.4	37.7	6.5
1977(r)	189.2	121.6	18.2	15.6	41.6	6.1
1978(r)	210.1	137.7	19.3	17.3	49.4	6.5
1979(r)	241.6	161.4	21.4	19.9	60.4	8.6
1980(r)	258.0	171.6	22.0	19.8	67.2	11.0
1981	276.4	185.2	25.2	20.3	72.2	13.6

NA - Not Available. r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' INVENTORIES
Selected Industry Groups, 1965 to Date
(Book Value in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products
1965	$ 8.8	$ 6.1	$3.3	$ 5.1	$1.7
1967	11.0	8.4	3.5	9.3	2.3
1968	11.6	8.8	3.9	10.5	2.5
1969	13.3	9.6	4.1	11.8	2.7
1970	14.4	9.8	4.2	10.4	2.9
1971	14.2	9.4	4.2	9.6	3.0
1972	15.1	9.9	4.7	10.1	3.2
1973(r)	18.4	12.1	5.8	10.7	3.6
1974	24.1	14.0	6.7	12.5	4.9
1975(r)	24.1	13.0	6.1	13.5	4.8
1976(r)	25.3	14.5	8.0	13.1	5.4
1977(r)	27.3	16.4	9.3	13.3	6.0
1978(r)	31.6	18.9	10.3	15.9	6.9
1979(r)	37.5	22.7	10.9	21.3	8.2
1980(r)	39.2	24.4	9.7	27.1	9.3
1981	42.5	26.3	9.0	30.7	9.8

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS
Major Industry Groups, 1965 to Date
(Billions of Dollars)

			By Industry Group		By Capital Goods Industries	
Year	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1965	$ 505.2	$ 279.3	$ 43.4	$ 33.9	NA	NA
1967	564.7	310.0	45.1	41.7	NA	NA
1968	608.2	337.4	48.1	45.1	$ 84.8	$26.8
1969	647.6	358.6	54.9	47.7	92.9	24.5
1970	624.8	329.0	51.8	44.4	81.6	21.5
1971	671.9	360.1	51.3	44.4	90.2	19.0
1972(r)	770.0	420.8	61.4	52.9	103.5	20.8
1973(r)	915.1	515.2	80.8	64.8	131.7	23.7
1974(r)	1,047.2	562.2	99.0	74.4	152.1	25.7
1975(r)	1,021.8	504.2	74.1	64.4	132.1	24.8
1976(r)	1,194.5	616.8	94.5	76.2	153.6	31.1
1977(r)	1,380.3	732.9	105.9	91.5	183.3	35.2
1978(r)	1,579.3	868.3	125.4	104.9	233.4	41.5
1979(r)	1,770.9	952.2	139.2	118.1	270.1	40.7
1980(r)	1,860.7	951.2	134.1	116.0	270.6	56.2
1981	1,998.0	1,020.8	134.4	121.7	281.6	62.6

NA - Not Available.   r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' UNFILLED ORDERS
Major Industry Groups, 1965 to Date
(Billions of Dollars, Seasonally Adjusted)

			By Industry Group		By Capital Goods Industries	
As of Dec. 31	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1965	$ 80.1	$ 76.3	$ 6.0	$ 9.6	NA	NA
1967	105.0	101.0	7.2	13.0	NA	NA
1968	109.9	105.9	6.5	13.9	$ 49.5	$24.7
1969	115.1	111.0	7.9	15.0	53.9	22.4
1970	105.9	101.3	7.7	14.9	47.8	20.2
1971	106.8	101.7	7.4	13.5	49.4	19.6
1972(r)	121.1	114.7	10.3	15.1	54.6	19.7
1973(r)	161.3	153.9	18.5	21.1	70.5	22.0
1974(r)	191.1	185.6	21.9	28.2	86.8	26.3
1975(r)	173.8	165.9	15.1	24.1	79.4	28.1
1976(r)	182.5	174.2	16.8	23.0	81.7	32.0
1977(r)	204.8	196.4	19.6	24.5	90.6	37.1
1978(r)	261.1	250.8	27.2	28.1	116.3	47.4
1979(r)	305.0	293.7	30.2	31.1	144.1	53.5
1980(r)	319.7	308.8	30.2	30.2	147.7	68.4
1981	319.9	309.6	26.6	28.7	140.7	80.9

NA - Not Available.   r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS
Selected Industry Groups, 1965 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1965	$ 43.0	$ 36.6	$22.8	$ 51.0	$1.7
1967	49.8	43.2	30.4	45.6	1.4
1968	51.9	46.3	28.2	57.7	1.5
1969	59.4	48.0	24.7	59.2	1.7
1970	54.9	47.0	17.4	50.0	.9
1971	56.1	48.5	22.5	67.4	.8
1972(r)	70.9	54.1	21.0	75.5	1.4
1973(r)	89.2	64.7	26.7	91.5	2.6
1974(r)	105.3	67.8	29.9	94.1	2.6
1975(r)	92.7	62.8	26.9	82.2	1.3
1976(r)	107.4	77.0	31.9	111.7	2.2
1977(r)	126.5	92.5	40.8	134.1	3.0
1978(r)	154.2	106.6	55.1	157.5	4.3
1979(r)	174.5	118.4	65.2	157.4	5.6
1980(r)	182.8	130.7	63.7	139.0	4.8
1981	204.9	140.8	59.4	161.4	2.9

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972 - 1980" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

MANUFACTURERS' UNFILLED ORDERS
Selected Industry Groups, 1965 to Date
(Billions of Dollars, Seasonally Adjusted)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1965	$15.0	$11.8	$23.0	$ 6.4	$1.3
1967	19.4	15.5	34.8	6.0	1.3
1968	20.4	16.4	35.5	7.8	1.1
1969	23.7	16.8	33.4	8.7	1.2
1970	22.1	16.6	26.3	8.6	.7
1971	22.2	17.2	26.4	9.6	.6
1972(r)	27.5	18.0	26.2	11.5	1.0
1973(r)	38.9	22.0	27.8	17.4	2.1
1974(r)	51.9	24.0	30.4	20.6	2.6
1975(r)	48.9	22.7	28.1	18.4	1.5
1976(r)	50.8	25.9	28.9	19.6	1.6
1977(r)	55.2	30.0	37.1	19.2	2.3
1978(r)	66.4	36.2	54.6	25.3	3.6
1979(r)	74.3	42.3	75.9	26.0	5.4
1980(r)	74.4	47.2	88.4	24.7	5.5
1981	74.7	51.6	90.4	23.5	3.3

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1965 to Date
(Billions of Dollars)

Year	Total Manufacturing	Durables	By Industry Group: Primary Metals	By Industry Group: Fabricated Metal Products	By Capital Goods Industries: Nondefense	By Capital Goods Industries: Defense
1965	$ 491.9	$ 266.7	$ 44.0	$ 32.4	NA	NA
1967	557.8	30[illegible].2	45.1	40.1	NA	NA
1968	603.2	332.4	48.7	44.1	$ 81.4	$ 26.7
1969	642.5	353.7	53.5	46.6	88.5	26.5
1970	634.0	338.6	52.0	44.5	87.5	23.8
1971	671.1	359.7	51.6	45.7	88.5	19.7
1972(r)	756.3	408.3	58.4	51.5	97.9	20.2
1973(r)	875.2	476.2	72.7	58.9	115.8	21.4
1974(r)	1,017.5	530.7	95.6	67.3	135.9	21.3
1975(r)	1,039.1	523.9	80.8	68.5	139.6	23.0
1976(r)	1,185.6	608.3	93.0	77.4	151.4	26.7
1977(r)	1,358.4	711.2	103.2	90.0	174.5	30.1
1978(r)	1,523.4	814.2	118.1	101.3	20[illegible]	31.0
1979(r)	1,727.3	909.6	136.2	115.2	242.6	34.4
1980(r)	1,845.9	936.0	134.1	116.9	267.2	41.2
1981	1,997.8	1,019.9	138.0	123.1	288.6	49.9

NA - Not Available. r - Revised.

Source: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1965 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products	Machine Tools
1965	$ 39.5	$ 34.3	$ 45.2	$23.1	$ 8.6	$1.4
1967	49.2	42.2	40.3	32.2	11.2	1.8
1968	51.0	45.2	49.5	34.1	12.3	1.7
1969	56.1	47.6	50.9	34.2	13.1	1.6
1970	56.5	47.2	42.5	32.0	13.1	1.4
1971	56.0	48.0	58.2	30.6	13.5	1.0
1972	65.8	53.4	63.9	30.8	15.5	1.0
1973	77.8	60.9	74.8	35.8	17.9	1.5
1974	92.5	65.8	68.6	39.6	21.0	2.0
1975	95.8	64.2	70.0	43.5	22.1	2.5
1976	105.5	73.9	95.4	45.6	25.0	2.1
1977(r)	122.2	88.4	117.7	49.2	28.9	2.3
1978(r)	143.2	100.5	132.0	56.8	33.7	3.0
1979(r)	166.7	112.5	133.1	67.4	39.3	3.9
1980(r)	182.8	125.9	114.9	76.5	46.0	4.7
1981	204.6	136.6	137.4	82.4	50.2	5.1

r - Revised.

Source: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

SHIPMENTS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1976 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1976	1977	1978	1979	1980	1981
Metalworking Machinery Industry (SIC 354) (a,r)						
Jan.	$ 446	$ 470	$ 587	$ 645	$ 798	$ 826
Feb.	480	581	669	798	965	1,018
Mar.	546	626	748	890	1,055	1,074
Apr.	468	551	692	757	873	985
May	515	554	690	790	907	939
June	539	664	787	901	1,047	1,078
July	449	513	620	726	741	832
Aug.	418	539	680	770	811	899
Sept.	538	641	822	909	981	1,077
Oct.	476	586	730	891	991	1,000
Nov.	480	600	719	867	972	885
Dec.	569	672	766	881	1,045	915
TOTAL	$5,924	$6,997	$8,508	$9,825	$11,186	$11,528
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	$ 156	$ 145	$ 209	$ 245	$ 331	$ 389
Feb.	175	169	202	280	355	422
Mar.	201	183	272	333	460	477
Apr.	173	177	243	305	343	448
May	162	186	256	323	375	411
June	183	222	293	351	476	509
July	149	168	208	268	327	367
Aug.	124	145	215	285	311	325
Sept.	187	211	264	347	411	442
Oct.	163	193	267	380	440	407
Nov.	177	222	274	361	400	408
Dec.	210	260	310	399	463	491
TOTAL	$2,060	$2,281	$3,013	$3,877	$4,692	$5,096

r - Revised.

(a) Adjusted for trading-day and calendar month variation.

(b) Shipments of new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972-80" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The cyclical nature of the machine tool industry is apparent in both new orders and shipment figures. Shipments totaled $2.0 billion in 1974, grew to almost $2.5 billion by 1975, dropped by 16% in 1976 and have since grown to almost $5.1 billion in 1981.

NET NEW ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS (r)

Monthly, 1976 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1976	1977	1978(r)	1979	1980	1981
Metalworking Machinery Industry (SIC 354) (a)						
Jan.	$ 408	$ 533	$ 619	$ 806	$ 1,022	$ 831
Feb.	430	545	877	984	1,172	879
Mar.	521	675	868	1,077	1,240	984
Apr.	451	633	748	979	888	844
May	453	685	912	953	828	709
June	535	739	917	973	1,027	855
July	452	606	836	943	735	620
Aug.	537	683	931	976	635	774
Sept.	563	693	850	1,240	909	747
Oct.	498	680	815	1,061	866	764
Nov.	664	689	948	1,014	773	623
Dec.	620	765	808	906	933	457
TOTAL	$6,132	$7,926	$10,129	$11,912	$11,028	$9,087
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	$ —	$ —	$ —	$ —	$ —	$ 291
Feb.	—	—	—	—	—	280
Mar.	413	667	940	1,471	1,517	350
Apr.	—	—	—	—	—	320
May	—	—	—	—	—	229
June	497	771	1,130	1,356	1,335	318
July	—	—	—	—	—	192
Aug.	—	—	—	—	—	214
Sept.	597	726	1,028	1,353	818	187
Oct.	—	—	—	—	—	216
Nov.	—	—	—	—	—	196
Dec.	696	832	1,251	1,440	984	152
TOTAL	$2,203	$2,995	$4,349	$5,621	$4,754	$2,945

r - Revised.

(a) Adjusted for trading-day and calendar month variation.

(b) Net new orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972-80" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The most dramatic indicator of the cyclical nature of the machine tool business is new orders, which generally follow the growth of the economy except that the cycles involved are much more pronounced. In 1975 new orders were only 45% of the level experienced in 1973. The economic recovery since the 1974 recession was especially strong in the machine tool sector with 1979 orders running at record levels, well in excess of $5 billion. This strength in machine tool orders continued into early 1980, but slowed significantly in the second half of the year. The slackening of the order rate was produced by the reductions in capital investment spending which followed the sharp decline in GNP of the second quarter of the year. In spite of newly introduced investment incentives, the tight money supply situation and the deepening recession of 1981 caused net new orders to continue weakening throughout 1981, yielding a 38% decline for the year.

UNFILLED ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS (r)

Monthly, 1976 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1976	1977	1978	1979	1980	1981
Metalworking Machinery Industry (SIC 354) (a)						
Jan.	$2,523	$2,832	$3,730	$5,480	$7,630	$6,893
Feb.	2,473	2,796	3,938	5,666	7,837	6,754
Mar.	2,448	2,845	4,058	5,853	8,022	6,663
Apr.	2,431	2,927	4,114	6,075	8,037	6,872
May	2,369	3,058	4,336	6,238	7,958	6,643
June	2,365	3,133	4,466	6,310	7,938	6,420
July	2,368	3,226	4,682	6,527	7,932	6,208
Aug.	2,487	3,370	4,933	6,733	7,756	6,083
Sept.	2,512	3,422	4,961	7,064	7,684	5,753
Oct.	2,534	3,516	5,046	7,234	7,559	5,516
Nov.	2,718	3,605	5,277	7,381	7,360	5,255
Dec.	2,769	3,698	5,319	7,406	7,248	4,797
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	$ —	$ —	$ —	$ —	$ —	$5,353
Feb.	—	—	—	—	—	5,211
Mar.	1,332	1,764	2,565	4,257	5,760	5,083
Apr.	—	—	—	—	—	4,956
May	—	—	—	—	—	4,773
June	1,311	1,950	2,904	4,635	5,902	4,583
July	—	—	—	—	—	4,408
Aug.	—	—	—	—	—	4,296
Sept.	1,447	2,152	3,244	5,089	5,770	4,042
Oct.	—	—	—	—	—	3,852
Nov.	—	—	—	—	—	3,639
Dec.	1,594	2,308	3,644	5,388	5,451	3,300

r - Revised.

(a) Adjusted for trading-day and calendar month variation.

(b) Unfilled orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972- 80" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

During the current recession a large backlog of unfilled orders has protected the machine tool industry from too severe an impact resulting from the decline in orders. The backlog of unfilled orders, which had increased continuously for four years, peaked in mid-1980 at just over $5.6 billion. Since then, the slack pace of the economy has enabled builders to reduce the size of the accumulated volume of unfilled orders to $3.3 billion by the end of 1981.

PRODUCER PRICE INDEXES
For Selected Machine Tool Materials and Components
1967 = 100, unless otherwise indicated

Commodity	1965	1970	1975	1976	1977	1978	1979	1980	1981
Finished Goods	NA	NA	163.4	170.3	180.6	194.6	216.1	247.0(r)	269.8
All Commodities	96.6	110.4	174.9	182.9	194.2	209.3	235.6	268.8	293.4
Industrial Commodities	96.4	110.0	171.5	182.3	195.1	209.4	236.5	274.8	304.1
Manufactured Durables	95.8	112.0	165.6	175.5	188.1	204.7	226.1	250.8	269.7
Industrial Power, 500 KW Demand	100.3	106.6	209.7	226.9	257.0	279.5	305.3	368.1	422.2
Lubricating Oil Materials	99.4	100.0	266.5	265.1	304.3	349.5	477.9	756.4	873.6
Prepared Paint	96.4	112.4	166.9	174.2	182.4	192.3	204.4	235.3	249.8
Iron and Steel	97.9	115.1	200.9	215.8	230.4	253.6	283.5	305.2	333.8
Steel Mill Products	97.5	114.2	197.2	209.7	229.9	254.5	280.4	302.7	337.6
Semi-finished Steel Products	98.3	112.2	206.7	223.0	243.6	270.5	294.3	325.6	359.3
Finished Steel Products	97.5	114.2	196.6	208.9	229.0	253.5	279.5	301.2	336.2
Foundry and Forge Shop Products	94.6	112.1	194.3	218.3	230.5	249.5	277.1	310.0	329.8
Gray Iron Castings	89.2	112.2	180.1	199.7	211.1	225.1	245.5	270.7	NA
Steel Castings	98.1	119.5	196.8	216.3	234.4	257.3	291.9	327.8	NA
Gray & Ductile Iron Cast Dec. 1980 = 100	NA	NA	NA	NA	NA	NA	NA	NA	105.2
Nonferrous Metals	95.3	124.7	171.6	181.5	195.4	207.8	261.7	305.0	285.8
Primary Metal Refinery Shapes	96.8	127.7	184.8	191.6	206.0	218.3	295.4	377.2	326.1
Mill Shapes	92.9	122.1	180.9	194.1	213.1	229.9	270.4	292.7	304.1
Aluminum Shapes	99.4	109.7	163.8	176.8	202.1	226.5	247.3	266.7	293.4
Wire and Cable	89.3	126.7	152.3	151.3	156.1	155.2	186.5	217.6	207.5
Metalworking Machinery and Equipment	91.8	114.1	171.6	182.7	198.5	217.0	241.3	274.4	301.3
Cutting Tools & Access.	93.6	113.6	146.0	153.9	172.0	187.5	206.8	233.2	256.3
Abrasive Products	95.6	112.3	163.9	177.8	193.4	205.6	223.4	252.5	276.5
Metal Cutting Machine Tools	88.3	113.5	177.1	190.9	206.3	231.5	266.9	313.5(r)	344.8
Metal Forming Machine Tools	89.3	115.6	192.2	212.9	232.6	262.8	300.1	346.7	380.3
General Purpose Machy. & Equipment	92.5	113.7	178.5	189.7	201.8	216.6	236.4	264.6	288.7
Pumps, Compressors, & Equipment	90.3	114.7	187.4	197.9	211.6	228.0	249.1	287.7	324.5
Fluid Power Equipment, Dec. 1970 = 100	NA	NA	135.0	143.8	152.7	163.3	176.2	199.6	222.3
Fluid Power Pumps, Dec. 1970 = 100	NA	NA	133.4	143.0	152.0	161.7	174.9	198.6	223.9
Fluid Power Valves, Dec. 1971 = 100	NA	NA	127.2	134.2	142.6	150.3	162.1	180.5	200.1
Cylinders, Dec. 1971 = 100	NA	NA	133.7	142.3	151.1	164.3	177.7	205.5	230.1
Fluid Power Hose and Tube Fittings, Dec. 1972 = 100	NA	NA	135.8	143.3	151.3	166.5	178.0	204.3	223.5
Mechanical Power Transmission Equipment	95.1	115.3	173.7	185.1	196.6	213.0	234.6	264.0	294.8
Miscellaneous General Purpose Equipment	90.6	112.5	185.7	195.6	206.9	222.7	246.4	279.4	307.0
Ball & Roller Bearings	101.1	109.6	164.2	176.4	191.4	206.3	227.0	265.1	304.8
Electrical Machinery and Equipment	95.1	106.4	140.7	146.6	154.1	164.9	178.9	201.7	220.2
Motors, Generators, Motor Generator Sets	93.0	116.7	174.9	193.0	202.2	218.1	234.6	266.3	296.1
Electric Motors	93.9	114.8	166.8	179.2	192.5	207.3	229.0	252.3	278.8
Transformers and Power Regulators	90.8	99.2	134.5	138.4	146.5	155.2	164.3	182.7	208.8
Switchgear, Switchboard, etc. Equipment	96.0	106.7	154.5	161.9	173.9	184.0	200.0	233.0(r)	250.8
Electronic Components and Accessories	NA	101.0	115.5	115.4	119.5	126.9	135.8	156.3	168.1

NA - Not Available. r - Revised.

Note: The individual commodities shown are selected components of each major commodity grouping. All indexes are annual averages.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

NATIONAL DEFENSE PURCHASES
IMPLICIT PRICE DEFLATORS
By Major Type of Product, 1973 to Date
(Index 1972 = 100)

Year	Total Purchases	Durables Goods	Non-Durable Goods	Services	Structures	Compensation
1973	106.6	102.9	112.6	105.8	113.2	107.4
1974	115.1	104.6	170.4	116.3	126.5	113.0
1975	124.9	114.9	190.9	130.7	138.5	120.9
1976	132.4	124.2	205.8	141.0	144.3	126.9
1977(r)	142.7	136.9	224.4	154.4	147.8	134.0
1978	152.8	149.8	232.3	164.0	154.8	143.1
1979	165.7	162.0	292.4	177.8	174.4	152.3
1980	185.6	179.1	441.5	194.0	198.3	164.7
1981(p)	208.8	204.1	490.5	217.0	216.4	183.2

r - Revised. p - Preliminary.

Source: U.S. Bureau of Economic Analysis, "Price Changes of Defense Purchases of the United States".

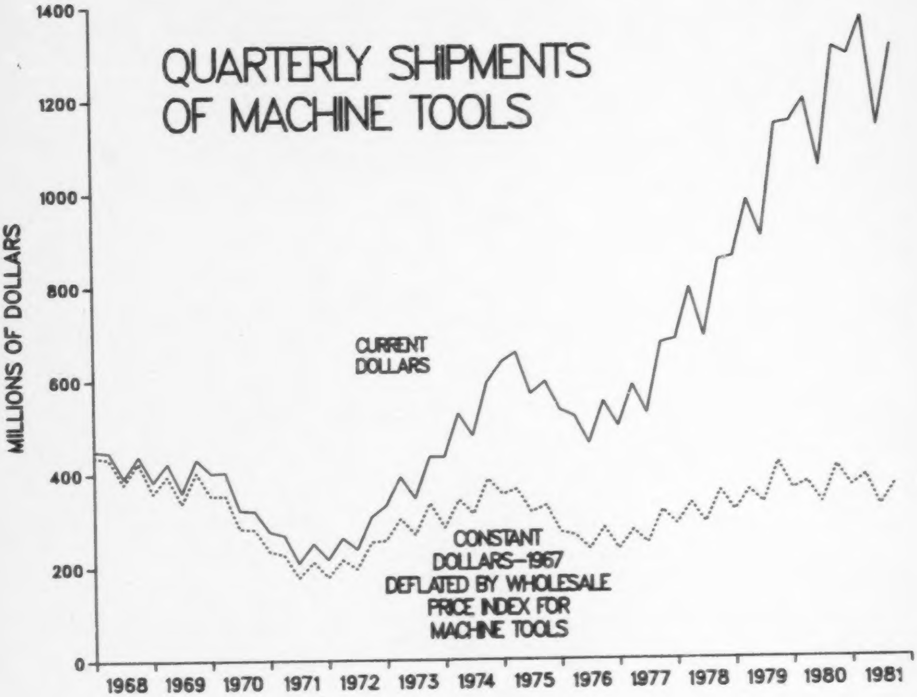
NATIONAL DEFENSE PURCHASES
By Major Type of Product, 1973 to Date

Year	Total Purchases	Durable Goods	Non-Durable Goods	Services	Structures	Compensation
In current dollars (billions)						
1973	$ 72.8	$14.1	$ 4.2	$15.9	$2.4	$36.3
1974	77.0	14.3	5.4	17.3	2.3	37.7
1975	83.0	17.6	5.3	17.8	2.5	39.8
1976	86.0	18.6	4.7	19.5	2.3	40.9
1977	93.3	21.3	5.4	21.2	2.5	42.8
1978	100.0	22.5	5.8	22.9	2.6	46.1
1979	111.2	26.8	7.0	26.2	2.4	48.8
1980	131.7	32.9	10.9	31.9	3.1	52.8
1981(p)	154.3	39.3	13.3	39.3	3.1	59.4
In constant 1972 dollars (billions)						
1973	$ 68.3	$13.7	$ 3.7	$15.0	$2.1	$33.8
1974	66.9	13.7	3.2	14.9	1.8	33.3
1975	66.4	15.4	2.8	13.6	1.8	32.9
1976	64.9	15.0	2.3	13.8	1.6	32.3
1977	65.4	15.6	2.4	13.7	1.7	32.0
1978	65.4	15.0	2.5	14.0	1.7	32.2
1979	67.1	16.6	2.4	14.7	1.4	32.0
1980	70.9	18.4	2.5	16.4	1.6	32.1
1981(p)	73.9	19.3	2.7	18.1	1.4	32.4

p - Preliminary.

Source: U.S. Bureau of Economic Analysis, "Price Changes of Defense Purchases of the United States".

The estimates in the above tables are from a report prepared by the Bureau of Economic Analysis (BEA). Prior to 1980, the BEA included only Department of Defense purchases in the defense spending series. Beginning in 1980, their statistics include defense activities of other Federal agencies as well. These tables have been revised to reflect that change.


QUARTERLY SHIPMENTS
OF MACHINE TOOLS
MILLIONS OF DOLLARS
1400
1200
1000
800
600
400
200
0
CURRENT
DOLLARS
CONSTANT
DOLLARS–1967
DEFLATED BY WHOLESALE
PRICE INDEX FOR
MACHINE TOOLS
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981

PRODUCER PRICE INDEXES FOR MACHINE TOOLS

1947 to Date

1967 = 100

Year	All Commodities	Durable Manufactures	Total (a) Machine Tools	Metal Cutting Machine Tools	Metal Forming Machine Tools
1947	76.5	59.3	35.7	34.3	39.6
1948	82.8	65.3	39.9	38.8	43.1
1949	78.7	67.3	47.2	41.2	45.1
1950	81.8	69.6	45.5	44.2	49.0
1951	91.1	76.3	52.7	51.6	55.7
1952	88.6	73.7	56.1	55.3	58.5
1953	87.4	78.4	56.9	55.8	59.8
1954	87.6	79.4	57.2	56.1	60.4
1955	87.8	82.2	60.1	58.3	65.2
1956	90.7	87.5	68.1	66.3	73.7
1957	93.3	90.9	72.8	71.3	77.8
1958	94.6	92.1	74.0	72.7	76.9
1959	94.8	94.0	75.2	74.3	77.5
1960	94.9	94.1	77.4	76.5	79.6
1961	94.5	93.6	79.0	78.8	79.5
1962	94.8	93.5	80.8	80.5	81.4
1963	94.5	93.6	81.1	80.8	81.9
1964	94.7	94.6	84.1	83.9	84.4
1965	96.6	95.8	88.6	88.3	89.3
1966	99.8	97.9	94.4	94.1	95.6
1967	100.0	100.0	100.0	100.0	100.0
1968	102.5	103.5	103.3	103.0	104.1
1969	106.5	107.7	107.1	106.8	107.4
1970	110.4	112.0	114.1	113.5	115.6
1971	113.9	117.0	118.2	117.1	121.0
1972	119.1	121.1	121.7	120.2	125.3
1973	134.7	127.4	129.6	128.2	133.0
1974	160.1	148.6	153.9	152.0	161.7
1975	174.9	165.6	180.5	177.1	192.2
1976	182.9	175.5	196.5	190.9	212.9
1977	194.2	188.0	213.3	206.3	232.6
1978	209.3	204.7	238.5	231.5	262.8
1979	235.6	226.1	273.2	266.9	300.1
1980(r)	268.8	250.8	319.0	313.5	346.7
1981	293.4	269.7	353.4	344.8	380.3

r - Revised.

(a) Constructed by NMTBA from BLS producer price indexes for metal cutting and metal forming machine tools using NMTBA net new order weights.

Source: U.S. Dept. of Labor, Bureau of Labor Statistics: U.S. Dept. of Commerce, "Business Statistics, 1977", "Survey of Current Business" (monthly), and NMTBA.

Because of the continuous technological improvement in machine tools and the increasing number of "custom built" machines, reliable wholesale price indexes (which are intended to measure price changes not influenced by changes in quality, product mix, etc.) are difficult to develop. The data should be used with caution.

SHIPMENTS OF MACHINE TOOLS AT CONSTANT PRICES

1947 to Date

(In 1981 Dollars)

	Metal Cutting		Metal Forming (a)	
Year	Current Dollars (Thousands)	1981 Dollars (Thousands)	Current Dollars (Thousands)	1981 Dollars (Thousands)
1947	$ 306,000	$3,076,058	—	—
1948	288,450	2,563,339	—	—
1949	249,150	2,085,119	—	—
1950	305,550	2,383,567	—	—
1951	632,250	4,224,802	—	—
1952	1,125,900	7,020,078	—	—
1953	1,191,200	7,360,677	—	—
1954	891,750	5,480,845	—	—
1955	670,400	3,964,904	—	—
1956	945,200	4,915,610	$ 432,100	$2,229,683
1957	900,150	4,353,040	342,550	1,674,444
1958	438,400	2,079,234	152,800	755,655
1959	440,600	2,044,669	175,400	860,705
1960	541,500	2,440,643	202,500	967,472
1961	541,250	2,368,312	209,650	1,002,892
1962	612,850	2,624,977	208,400	973,643
1963	638,450	2,724,475	257,300	1,194,764
1964	844,650	3,471,220	319,700	1,440,544
1965	1,022,550	3,992,925	403,050	1,716,460
1966	1,221,750	4,476,721	463,450	1,843,620
1967	1,353,200	4,665,834	452,750	1,721,808
1968	1,358,300	4,547,008	368,600	1,346,576
1969	1,192,450	3,849,782	405,100	1,434,446
1970	992,900	3,016,316	450,150	1,480,900
1971	672,300	1,979,582	325,600	1,023,353
1972	714,450	2,049,437	304,250	923,434
1973	1,073,750	2,887,902	427,250	1,221,678
1974	1,445,850	3,279,797	584,700	1,375,148
1975	1,878,650	3,657,586	573,050	1,133,876
1976	1,482,100	2,676,941	577,550	1,031,669
1977	1,650,800	2,759,069	629,950	1,029,966
1978	2,188,500	3,259,589	824,950	1,193,792
1979	2,930,050	3,785,243	946,500	1,199,447
1980	3,680,800	4,048,293	1,010,950	1,108,925
1981	4,104,500	4,104,500	991,100	991,100

(a) Shipment data not available prior to 1956.

Note: 1981 dollar values developed from the Producer Price Index (formerly Wholesale Price Index) for metal cutting and metal forming machine tools.

Source: U.S. Department of Labor, Bureau of Labor Statistics, NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

When converted to constant dollars, the apparent record shipments in recent years disappear. For the years shown above, the historical constant dollar average for metal cutting is $3,549,088 and for metal forming is $1,264,462.

2

WORLD ECONOMY

The tables in this chapter are intended to provide a perspective of the U.S. position in the world economy. The picture has changed dramatically in the last three decades as the rate of economic growth in many of the world's industrialized nations has surpassed that of the U.S. and their per capita income is approaching the levels achieved domestically. Also, the changes in the world's economic structure brought about by OPEC and the growth of many developing nations into newly industrialized powers have led to major shifts in the balance of economic power in the world. The rise to wealth of these developing nations has been accompanied by a substantial increase in world trade. Increasing specialization by these and the major industrial nations has created an environment of interdependence in which each nation is but a piece of the larger world economic puzzle.

Trends in growth rates in selected industrialized countries are presented in tables on Gross National Product, Real Gross National Product, and Industrial Production. Factors underlying these growth trends are found in the tables on international investment patterns and various tables of comparative prices, wages, productivity, and unit labor costs. The data and charts on cost recovery allowable for tax purposes on machinery and equipment in selected industrial countries are especially interesting. These graphically demonstrate how our industrial competitors are able to invest more than the average American firm, and by inference, they also demonstrate why the U.S. rate of productivity growth is considerably lower than that of our major competitors.

Growth in the world economy and world trade has brought about a growing interest in the balance of payments positions of the various countries. A nation's balance of payments is considered a key indicator of the health or weakness of an individual economy. The same can be said for an industry trading in the world marketplace. In recent years disparate inflation rates, exchange rate movements, the phasing of national business cycles, and energy related problems have caused dislocations in many nations' and industries' balance of payments positions.

The overall United States balance of trade has fluctuated in recent years between small surpluses and record deficits. Until 1978, the U.S. machine tool industry remained in surplus in its world trade position though the relative size of the surplus had been declining during the 1970's. Record high machine tool imports by U.S. manufacturers coupled with only relatively small increases in machine tool exports led to substantial balance of trade deficits in U.S. machine tool trade in 1978 through 1981. In a little over a decade the share of the domestic market represented by imports has grown from a negligible amount to almost one-third of total U.S. machine tool consumption.

The tables in this chapter provide comparative international statistics on world trade, balance of trade, balance of payments and export prices.

GROSS NATIONAL PRODUCT

(Billions of U.S Dollars)

	1970	1973	1974	1975	1976	1977	1978	1979	1980(a)(r)	1981(E)
WORLD	$3,902	$5,295	$5,990	$6,552	$7,227	$7,960	$9,660	$10,807	$12,215	$11,653
Of which:										
United States	993	1,326	1,567	1,549	1,718	1,918	2,156	2,414	2,626	2,926
Canada	82	124	151	163	194	196	202	224	248	274
Japan	196	417	463	498	559	687	963	999	1,036	1,127
European Comm. (b)	628	1,065	1,167	1,100	1,149	1,312	1,619	1,937	2,161	1,850
United Kingdom	124	180	195	235	228	251	318	410	524	422
France	148	250	265	340	352	385	476	576	656	574
West Germany	186	344	381	421	447	517	643	763	821	687
Italy	93	142	156	191	188	215	262	325	394	350
U.S.S.R.(a)	521	681	784	903	975	1,066	1,152	1,260	1,393	NA
China(a)	158	231	263	307	323	142	179	215	242	223
PER CAPITA										
United States	$4,794	$6,210	$6,668	$7,173	$7,879	$8,709	$9,686	$10,726	$11,535	$12,730
Canada	3,840	5,597	6,735	7,154	8,414	8,436	8,599	9,439	10,355	11,327
Japan	1,890	3,836	4,203	4,465	4,954	6,030	8,384	8,621	8,870	9,578
European Comm. (b)	2,580	4,391	4,797	5,668	5,907	6,730	8,284	9,879	10,990	9,391
United Kingdom	2,220	3,219	3,487	4,200	4,072	4,501	5,689	7,335	9,360	7,549
France	2,910	4,796	5,049	6,431	6,659	7,251	8,932	10,772	12,214	10,643
West Germany	3,030	5,555	6,147	6,803	7,264	8,420	10,481	12,415	13,333	11,165
Italy	1,740	2,583	2,818	3,425	3,338	3,806	4,615	5,711	6,907	6,133
U.S.S.R.(a)	2,147	2,726	3,111	3,541	3,794	4,116	4,414	4,791	5,237	NA
China (a)	186	253	282	323	333	151	187	222	247	224

E - Estimate. r - Revised.

(a) Data for the China series prior to 1977 and for the USSR series are reported in U.S. purchasing power equivalents. Data for the China series from 1977 through the present are GDP figures obtained from Chinese agencies.

(b) Data for the European Economic Community (EEC) on this table contains statistics for only the original six member countries in order to maintain comparability of the time series.

Source: International Monetary Fund, "International Financial Statistics", Department of Commerce, Industry and Trade Administration, and "The Economic Report of the President, 1982".

REAL GNP TRENDS
(1967 = 100)

	United States	Canada	Japan	European Community	United Kingdom(a)	France(a)	West Germany	Italy (a)
1961	75	71	57	78	85	70	80	75
1962	79	76	61	81	86	75	84	79
1963	82	80	68	85	89	80	87	83
1964	87	85	77	90	95	86	92	86
1965	92	91	81	94	96	90	97	88
1966	97	97	89	97	97	95	100	93
1967	100	100	100	100	100	100	100	100
1968	105	106	113	105	104	104	107	106
1969	108	111	127	112	105	112	115	112
1970	107	114	139	117	108	118	122	118
1971	111	122	146	121	111	124	126	120
1972	117	130	159	126	113	132	130	124
1973	124	139	173	133	121	139	137	133
1974	123	144	170	135	120	143	137	138
1975	122	146	175	133	119	143	135	133
1976	129	154	184	138	124	151	142	141
1977	136	158	194	144	125	155	146	143
1978	142	163	204	149	129	161	151	147
1979	147	167	215	154	131	167	158	154
1980(r)	146	168	224	156	129	169	161	161
1981	149	173	231	155	NA	170(E)	161	161(E)

E - Estimate. r - Revised.

(a) Gross Domestic Product.

Source: International Monetary Fund, "International Financial Statistics"; Organization for Economic Cooperation and Development.

INTERNATIONAL INVESTMENT PATTERNS

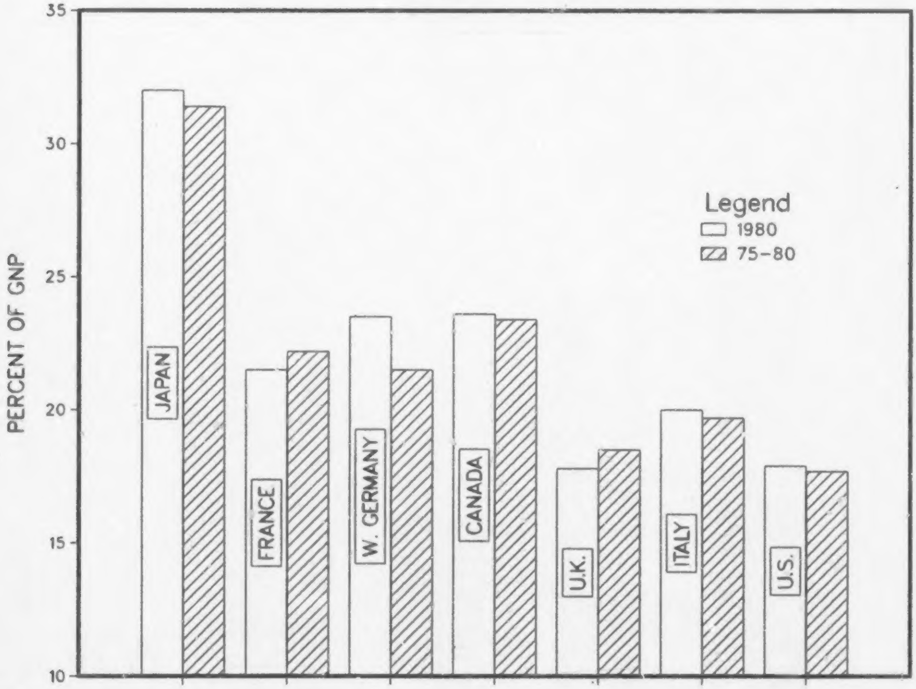
	Gross Fixed Capital Formation as Percent of GNP				
	1980	1979	1978	1970-1975	1960-1970
United States	17.9%	19.1%	19.1%	17.6%	15.2%
Italy	20.0	18.9	18.7	21.0	20.8
United Kingdom	17.8	17.7	18.0	19.3	17.9
Canada	23.6	23.1	22.7	22.7	22.2
West Germany	23.5	22.5	21.1	23.9	24.8
France	21.5	21.3	21.4	23.7	23.6
Japan	32.0	32.1	30.8	34.0	33.1

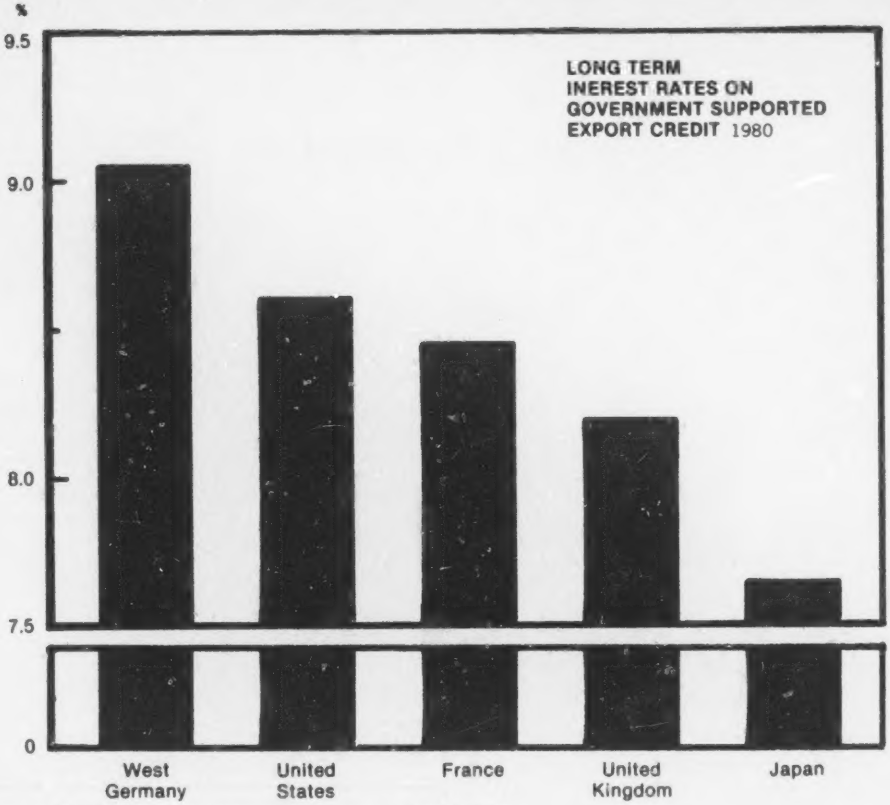
Note: Fixed Capital Formation consists of non-residential structures and producers durable equipment as well as residential structures.

Source: International Monetary Fund, "International Financial Statistics"; U.S. Department of Commerce.

The comparatively low percentage of the total Gross National Product (GNP) which is invested in fixed capital in the United States is one reason for its slower industrial growth. The additional fact that a smaller percentage of this investment is made in industry is another reason for concern for the industrial leadership of the United States.

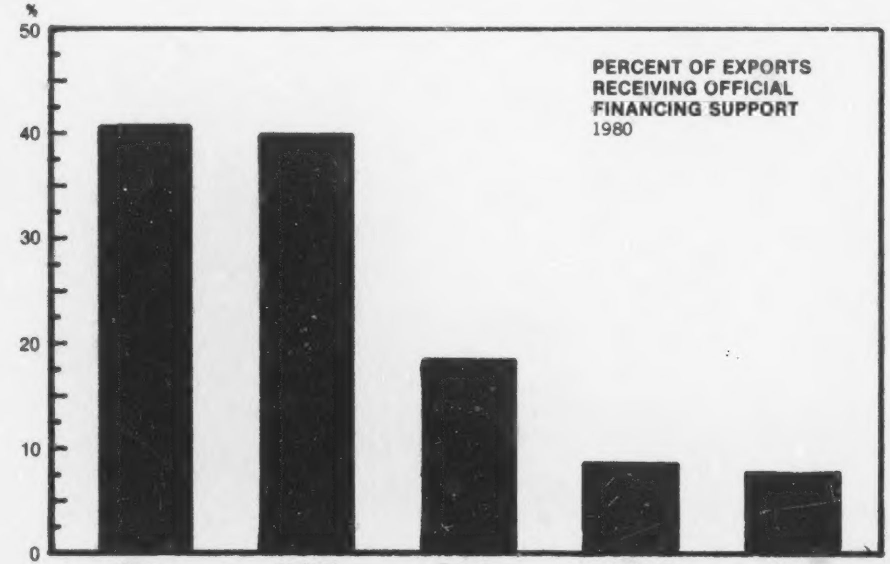
INTERNATIONAL INVESTMENT PATTERNS
Fixed Capital Formation as a
Percent of GNP





LONG TERM INEREST RATES ON GOVERNMENT SUPPORTED EXPORT CREDIT 1980

SOURCE: Export-Import Bank of the United States



PERCENT OF EXPORTS RECEIVING OFFICIAL FINANCING SUPPORT 1980

SOURCE: Export-Import Bank of the United States.

U.S. DIRECT INVESTMENT (a) ABROAD BY MAJOR INDUSTRY AND COUNTRY—YEAR END 1980

(Billions of U.S. Dollars)

	Total	Manufacturing	Mining and Smelting	Petroleum	Other
Developed Countries	$157.1	$71.4	$4.5	$34.2	$47.0
Canada	44.6	18.8	3.0	10.6	12.2
Europe	95.7	45.4	Z	19.9	30.3
European Community	76.6	41.5	D	16.9	18.2
United Kingdom	28.1	14.1	D	6.3	7.8
France	9.4	5.9	D	1.3	2.1
West Germany	15.4	9.7	Z	3.5	2.2
Other EEC	23.7	11.8	D	5.8	6.1
Other Europe	19.1	4.0	D	3.0	12.1
Japan	6.3	3.0	0.0	1.6	1.7
Australia, New Zealand, South Africa	10.5	4.2	1.5	2.1	2.7
Developing Countries	52.7	17.7	2.0	11.5	20.9E
Latin America	38.3	14.5	1.4	4.3	18.1
Middle East (c)	2.3	0.2	D	(b)	D
Other Africa (d)	3.7	0.4	0.6	2.2	0.6
Other Asia and Pacific	8.4	2.5	D	2.8	D
Other Countries	3.7	—	—	1.2	3.1
Total	$213.5	$89.1	$6.5	$46.9	$71.0

E - Estimate D - Withheld to avoid disclosure. Z - Less than $50 million.

(a) Book value.
(b) Included in "Other."
(c) Includes Bahrain, Iran, Israel, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, South Yemen, Syria, United Arab Emirates, Oman and Yemen.
(d) Includes United Arab Republic (Egypt).

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business," August 1981.

INDUSTRIAL PRODUCTION (a,r)
(1975 = 100)

Year	United States	Canada	Japan	EEC	United Kingdom	France	West Germany	Italy
1962	61.3	51.1	33.1	62.2	77.2	59.0	64.2	56.1
1963	64.9	54.5	36.8	65.4	79.4	61.0	66.1	61.4
1964	69.4	59.8	42.7	70.9	86.1	70.0	71.5	62.0
1965	76.2	64.8	44.3	72.4	88.8	67.0	75.4	64.9
1966	83.0	68.9	50.1	74.2	90.2	70.0	76.1	72.4
1967	84.9	71.4	59.9	75.7	91.2	72.0	73.7	78.3
1968	90.2	76.4	70.1	80.8	97.0	75.0	80.4	83.3
1969	94.3	81.3	81.3	89.0	99.6	83.0	91.4	86.6
1970	91.5	82.7	92.5	93.4	99.7	87.0	96.9	92.2
1971	93.0	87.0	94.9	95.4	99.8	92.0	98.7	92.1
1972	101.6	93.7	101.8	100.1	102.0	97.0	102.9	96.1
1973	110.2	102.8	117.0	108.0	109.5	104.0	109.0	105.4
1974	109.8	106.4	112.3	111.3	105.1	107.0	106.5	110.1
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	110.7	105.8	111.1	108.5	102.0	108.0	108.0	112.4
1977	117.2	108.5	115.7	109.6	105.9	110.0	110.0	113.6
1978	124.0	112.4	122.9	111.5	109.8	112.0	113.0	115.8
1979	129.2	118.3	133.1	116.4	112.6	117.0	119.0	123.5
1980	124.8	116.0	142.5	116.5	105.3	117.0	118.0	130.4
1981	128.1	117.3	146.5	112.9	99.6	113.0	116.0	127.4

r - Revised.

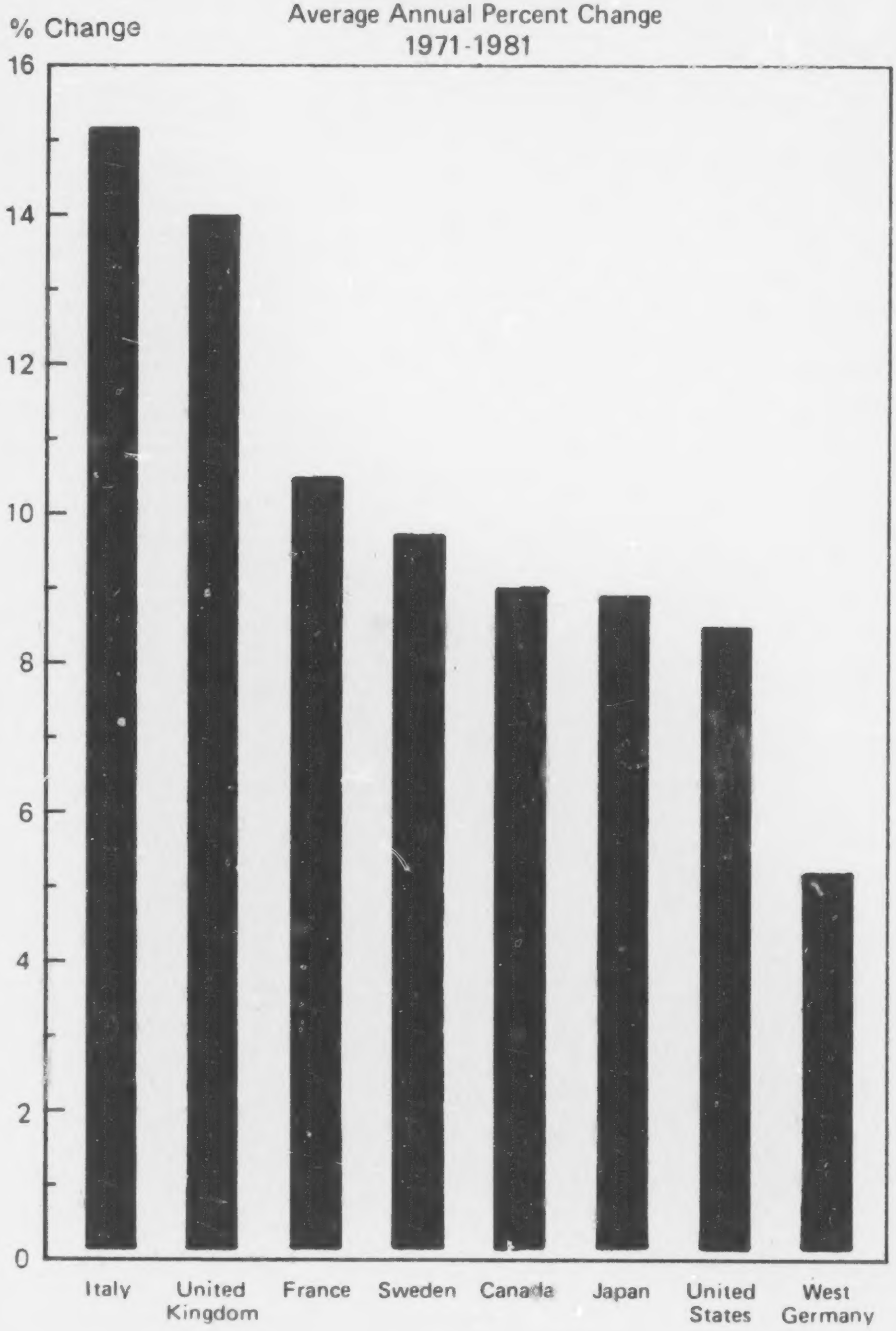
(a) Data for the European Economic Community (EEC) on this table contains statistics for only the original six member countries in order to maintain comparability of the series. Values are the unweighted means of the individual data of the original member countries.

Source: International Monetary Fund, "International Financial Statistics".

CONSUMER PRICES

Average Annual Percent Change

1971-1981



CONSUMER PRICES
(1975 = 100)

Year	United States	Canada	Japan	United Kingdom	France	West Germany	Italy	Sweden
1961	55.6	54.2	35.0	37.8	45.1	58.9	40.5	46.9
1962	56.2	54.8	37.3	39.3	47.4	60.6	42.4	49.1
1963	56.9	55.7	40.2	40.1	49.9	62.4	45.6	50.5
1964	57.6	56.8	41.7	41.4	51.4	63.8	48.3	52.2
1965	58.6	58.1	44.5	43.3	52.8	65.9	50.4	54.9
1966	60.4	60.3	46.7	45.0	54.2	68.2	51.6	58.4
1967	62.0	62.5	48.6	46.2	55.7	69.3	53.5	60.9
1968	64.6	65.0	51.2	48.4	58.2	70.5	54.3	62.1
1969	68.1	67.9	53.9	51.0	61.8	71.8	55.7	63.7
1970	72.1	70.2	58.0	54.2	65.4	74.2	58.4	68.2
1971	75.2	72.2	61.6	59.3	69.0	78.2	61.3	73.3
1972	77.7	75.7	64.3	63.6	73.3	82.5	64.8	77.7
1973	82.6	81.4	71.9	69.4	78.7	88.2	71.8	82.9
1974	91.6	90.3	89.4	80.5	89.5	94.4	85.5	91.1
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	105.8	107.5	109.3	116.5	109.6	104.3	116.8	110.3
1977	112.7	116.1	118.1	135.0	119.9	108.1	136.7	122.9
1978	121.2	126.5	122.6	146.2	130.8	111.1	153.3	135.1
1979	134.9	138.1	127.0	165.8	144.8	115.6	175.9	144.9
1980	153.1	152.1	137.2	195.6	164.1	122.0	213.2	164.7
1981	169.0	171.0	143.9	218.8	186.0	129.2	251.2	184.7

Source: International Monetary Fund, "International Financial Statistics".

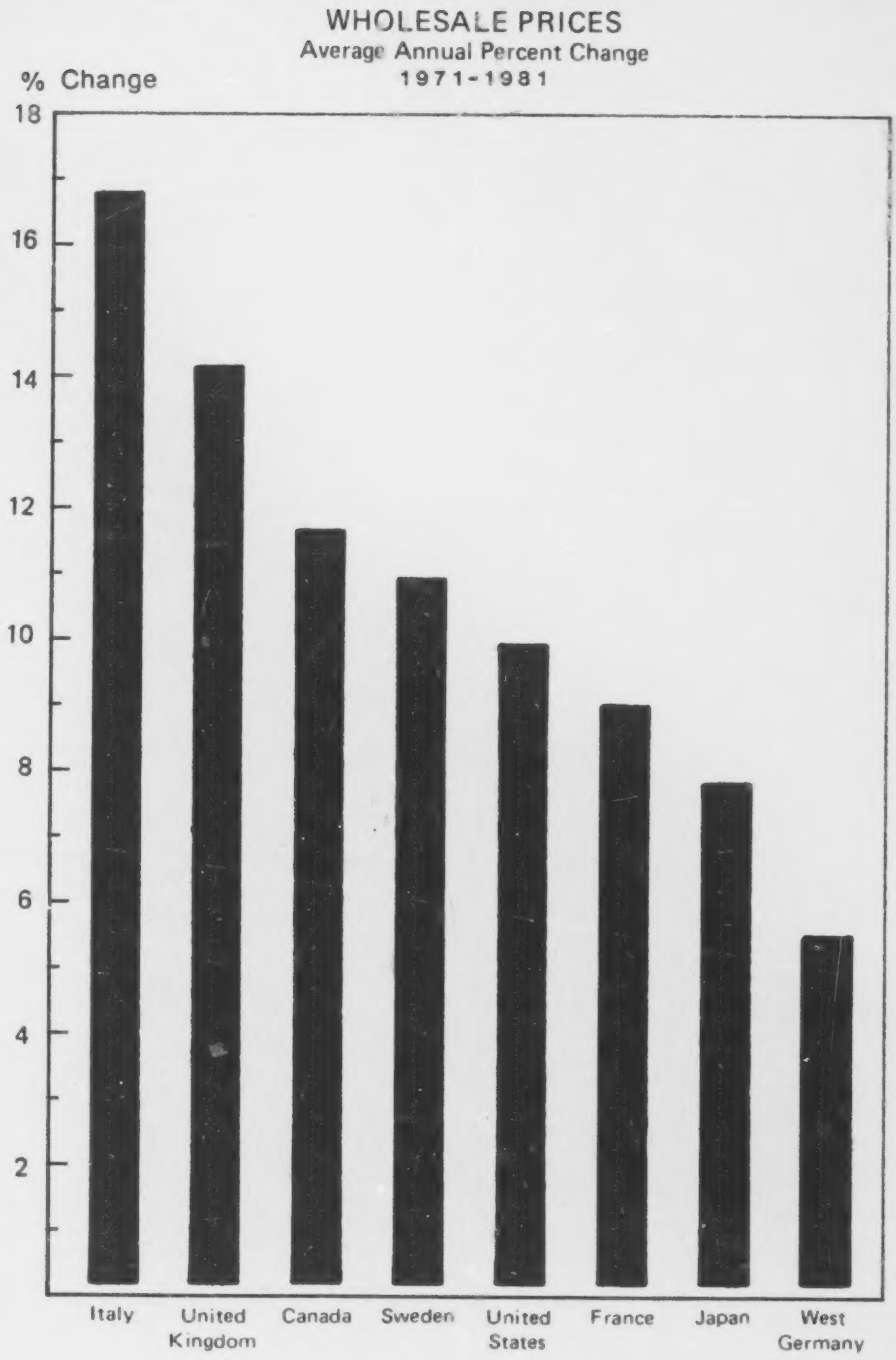
WHOLESALE PRICES
(1975 = 100)

Year	United States	Canada	Japan	United Kingdom(a)	France(b)	West Germany	Italy	Sweden(c)
1961	54.1	47.5	56.7	40.0	52.1	65.7	40.2	NA
1962	54.2	48.8	55.8	40.9	52.4	66.3	41.5	NA
1963	54.0	49.8	56.7	41.3	53.9	66.6	43.7	NA
1964	54.1	49.9	56.9	42.6	55.8	67.4	45.0	NA
1965	55.2	51.0	57.3	44.1	56.2	69.0	45.8	NA
1966	57.1	52.8	58.7	45.4	57.8	70.3	46.5	NA
1967	57.2	53.7	59.7	46.8	57.3	69.6	46.4	NA
1968	58.6	54.9	60.3	48.7	56.3	69.1	46.7	57.0
1969	60.9	57.4	61.5	50.5	62.3	70.3	48.4	59.0
1970	63.1	58.3	63.8	54.1	67.0	73.8	52.0	63.0
1971	65.2	59.0	63.3	59.0	68.4	77.0	53.7	65.0
1972	68.1	63.1	63.8	62.1	71.6	79.0	55.9	68.0
1973	77.0	75.5	73.9	66.7	82.1	84.2	65.5	75.0
1974	91.5	89.9	97.1	81.8	106.0	95.6	92.2	94.0
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	104.6	105.1	105.0	117.3	107.4	103.7	123.8	109.0
1977	111.0	113.4	107.0	140.5	113.4	106.5	144.3	119.0
1978	119.7	123.9	104.3	153.3	118.3	107.8	156.4	128.0
1979	134.7	141.8	111.9	172.0	134.0	113.0	180.7	144.0
1980(r)	153.6	160.9	131.8	200.0	145.8	121.5	217.0	164.0
1981	167.5	177.2	134.1	221.3	161.8	134.9	253.0	183.0

r - Revised.

(a) Industrial output prices.
(b) Industrial goods prices.
(c) Domestic supply prices.

Source: International Monetary Fund, "International Financial Statistics".



WHOLESALE PRICES
Average Annual Percent Change
1971-1981

UNIT VALUE OF EXPORTS (a)
Indexes, 1975 = 100

Year	United States	Canada	Japan	EEC(b)	United Kingdom	France	West Germany	Italy
1965	48.8	49.9	59.3	46.0	40.3	53.3	65.0	45.5
1966	50.3	52.1	59.2	46.5	41.8	54.7	65.8	45.0
1967	51.3	53.0	61.6	46.5	42.5	54.3	65.1	45.4
1968	52.0	54.3	61.2	46.0	45.8	53.9	64.3	45.2
1969	53.7	55.5	63.7	47.4	47.3	57.9	65.3	47.2
1970	56.7	57.3	67.2	50.2	52.5	63.9	70.8	49.0
1971	58.6	57.7	67.9	52.6	55.4	67.6	73.6	51.6
1972	60.3	59.6	66.7	58.6	58.7	68.3	75.7	53.2
1973	70.4	68.1	71.7	71.1	64.8	75.1	79.3	62.2
1974	89.4	90.3	98.3	88.3	81.8	94.7	92.1	88.2
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976(r)	103.3	102.4	98.7	108.9	119.7	109.1	104.1	120.4
1977(r)	107.1	109.0	98.4	116.9	141.6	119.9	105.2	144.3
1978(r)	115.3	118.6	92.4	119.9	155.2	126.0	105.2	154.4
1979(r)	133.8	143.4	102.3	133.0	171.5	138.2	108.4	181.6
1980(r)	148.0	168.2	114.4	151.1	192.7	153.2	116.0	220.1
1981	161.5	179.1	117.9	173.2	NA	173.2	124.8	269.0

r - Revised.

(a) U.S. dollar basis.

(b) Data for the European Economic Community (EEC) on this table contains statistics for only the original six member countries in order to maintain comparability of the time series.

Source: International Monetary Fund, "International Financial Statistics".

SOVIET UNION FOREIGN TRADE (a)
(Millions of U.S. Dollars)

Year	Exports			Imports		
	Total	Communist Countries (b)	Noncommunist Countries	Total	Communist Countries (b)	Noncommunist Countries
1962	$ 7,031	$ 4,905	$ 2,125	$ 6,455	$ 4,566	$ 1,890
1963	7,272	5,099	2,173	7,059	4,986	2,072
1964	7,683	5,407	2,276	7,737	5,346	2,390
1965	8,175	5,556	2,618	8,058	5,610	2,448
1966	8,841	5,873	2,968	7,913	5,264	2,649
1967	9,652	6,377	3,275	8,537	5,946	2,591
1968	10,634	7,134	3,500	9,410	6,367	3,043
1969	11,655	7,682	3,973	10,327	6,696	3,631
1970	12,800	8,367	4,433	11,732	7,636	4,095
1971	15,918	10,398	4,788	14,388	9,432	4,302
1972	16,312	10,608	6,768	17,049	10,913	6,216
1973	21,175	12,215	8,978	20,825	12,351	8,442
1974	27,374	14,641	12,733	24,861	13,601	11,260
1975	33,407	20,271	13,136	37,072	19,415	17,657
1976	37,550	22,040	15,510	38,542	20,246	18,296
1977	45,094	25,901	19,193	40,806	23,284	17,521
1978	52,432	31,244	21,188	50.798	30,494	20,305
1979	64,913	36,152	28,761	57,961	32,801	25,160
1980	76,470	41,463	35,007	6[illegible],477	36,424	32,052
1981(p)	79,377	43,353	36,024	7[illegible],[illegible]58	37,172	35,986

p - Preliminary.

(a) Exports and imports are F.O.B.

(b) The following are included in the Communist Countries category: Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, China, and Mongolian People's Republic.

Source: U.S. Department of Commerce, "Overseas Business Reports". Soviet foreign trade is growing rapidly with exports and imports keeping roughly in balance. However, imports from noncommunist countries have been growing at a faster average annual rate than both imports from Communist countries and total Soviet imports.

WORLD TRADE (a)
(Billions of U.S. Dollars)

	1978(r)		1979(r)		1980(r)		1981(p)	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
United States(b)	$ 144	$ 183	$ 182	$ 219	$ 221	$ 253	$ 236	$ 267
Canada	48	47	58	57	68	63	72	70
Japan	98	80	102	110	130	141	154	145
European Community	466	471	582	614	671	733	761	819
United Kingdom	72	79	91	103	115	120	104	102
France	79	82	101	107	116	135	108	122
West Germany	143	122	172	160	193	188	176	163
Italy	56	57	72	78	78	100	74	91
Other developed	127	137	162	175	195	230	222	256
Less developed	297	292	409	348	543	455	521	497
OPEC	144	97	211	100	298	136	270	163
Other	153	195	197	247	245	319	252	334
Communist	137	144	171	171	204	203	206	212
Total (c)	$1,318	$1,353	$1,665	$1,693	$2,031	$2,078	$2,171	$2,267

p - Preliminary. r - Revised.

(a) Import values are cost, insurance, and freight.
(b) Exports include Department of Defense shipments.
(c) Individual items may not add to totals due to rounding.

Source: "Economic Report of the President", February 1982.

These figures show exports and imports of merchandise only.

U.S. TRADE WITH COMMUNIST COUNTRIES (a)
(Millions of U.S. Dollars)

	U.S. Exports			U.S. Imports		
	To Eastern Europe (b)	To USSR	To People's Republic of China	From Eastern Europe (b)	From USSR	From People's Republic of China
1960	$ 154.9	$ 39.6	Z	$ 58.3	$ 22.6	$ 0.3
1961	87.9	45.7	Z	57.9	23.2	0.4
1962	105.1	20.2	Z	62.6	16.3	0.2
1963	143.9	22.9	Z	60.3	21.2	0.3
1964	193.6	146.4	Z	77.8	20.7	0.5
1965	94.8	45.2	Z	94.8	42.6	0.5
1966	156.0	41.7	Z	129.1	49.6	
1967	135.0	60.3	Z	136.1	41.2	0.2
1968	157.3	57.7	Z	140.0	58.5	Z
1969	143.7	105.5	Z	144.0	51.5	Z
1970	234.9	118.7	Z	153.5	72.3	Z
1971	222.2	162.0	Z	165.8	57.2	4.9
1972	276.9	542.2	$ 63.5	225.0	95.5	32.4
1973	606.5	1,194.7	689.6	306.1	220.1	[illegible]
1974	823.4	609.2	807.4	539.4	350.4	114.7
1975	951.0	1,836.9	303.8	472.9	255.3	157.4
1976	1,189.7	2,305.9	135.4	646.2	220.6	201.9
1977	911.9	1,623.5	171.3	683.7	234.3	202.7
1978(c)	1,420.2	2,249.0	818.2	969.8	540.4	324.0
1979(c)	2,066.2	3,603.6	1,716.5	998.8	873.2	592.3
1980(c)	2,339.8	1,509.7	3,749.0	982.0	452.9	1,058.3
1981(c)	1,904.2	2,338.6	3,598.6	1,206.7	347.4	1,895.3

Z - Less than $50,000.

(a) Exports and imports are f.a.s. transaction values, except prior to 1974, where imports are customs values.
(b) Does not include Yugoslavia.
(c) Data for 1978 to the present are not directly comparable to prior years due to commodity schedule changes.

Source: U.S. Department of Commerce: "Overseas Business Reports".

BALANCE OF TRADE AND PAYMENTS

(Billions of U.S. Dollars)

	Balance of Trade (a)	Balance on Current Account (b)
United States (c)		
1979	−37.0	1.4
1980	−32.3	3.7
1981E	−31.4	8.8
Canada		
1979	1.3	−4.2
1980	5.1	−1.6
1981E	1.5	−7.5
Japan		
1979	−7.5	−8.8
1980	−10.9	−10.7
1981E	8.5	5.5
United Kingdom		
1979	−11.8	−1.8
1980	−4.8	7.5
1981E	2.4	14.3
France		
1979	−6.3	1.2
1980	−18.9	−7.4
1981E	−14.0	−6.5
West Germany		
1979	12.2	−5.3
1980	4.9	−16.4
1981E	−12.5	−8.5
Italy		
1979	−5.7	5.5
1980	−21.8	−9.6
1981E	−16.9	−9.5

r - Revised. E Estimate.

(a) Balance of payments basis.
(b) Net exports of goods and services and unilateral transfers.
(c) Refer to Chapter 1 for historical chart of the United States balance of trade.

Source: "Economic Report of the President", February 1982.

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS IN MANUFACTURING

For Selected Years

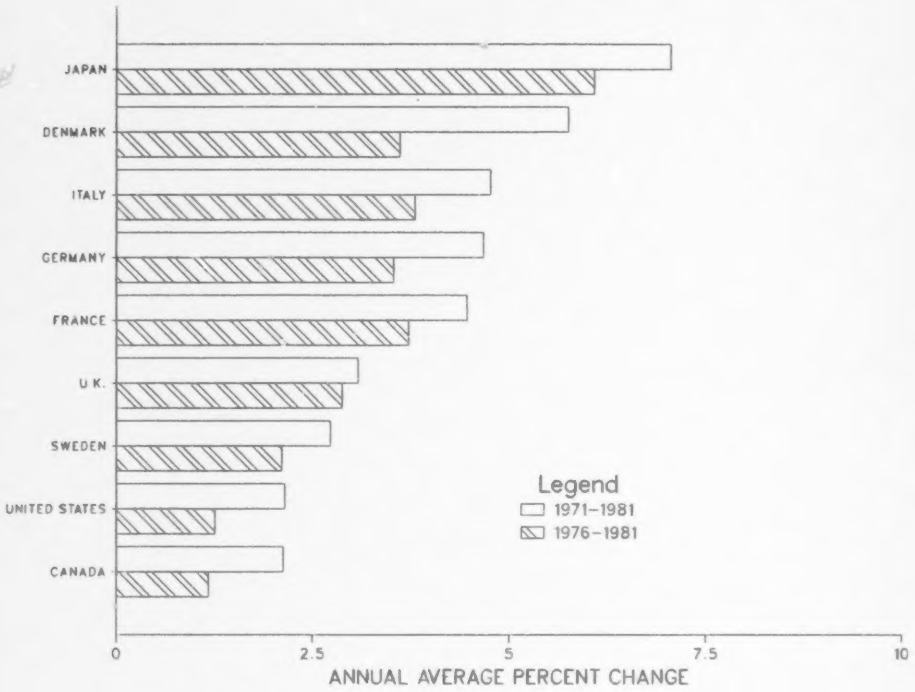
(U.S. Dollars)

	1960	1970	1975(r)	1979(r)	1980(r)	1981	Percent Increase 1975-1981
United States	$ 2.66	$ 4.20	$ 6.35	$ 9.08	$ 10.00	$ 11.06	74%
Canada	2.13	3.46	6.11	8.15	9.04	9.86	61
United Kingdom	.82	1.46	3.27	5.50	7.37	7.43	127
France	.83	1.74	4.58	7.90	9.23	8.28	81
West Germany	.83	2.32	6.19	11.26	12.26	10.47	69
Italy	.63	1.75	4.60	7.19	8.26	7.59	65
Sweden	1.20	2.96	7.18	11.33	12.51	11.86	66
Japan	.26	.99	3.05	5.49	5.61	6.23	104

r - Revised.

Source: U.S. Department of Labor, Bureau of Labor Statistics. For international comparisons of compensation in the machine tool industry, see Chapter 7.

PRODUCTIVITY
Increase in Output per Man-Hour in Manufacturing



PRODUCTIVITY IN MANUFACTURING (r)
Selected Countries 1963 to Date
Indexes: 1977 = 100

	United States	Canada	Japan	France	West Germany	Italy	United Kingdom
Unit Labor Cost (a)							
1963	58.5	50.7	34.9	47.0	31.5	40.8	48.8
1964	58.1	50.4	34.6	48.1	31.7	42.9	48.7
1965	57.4	51.0	37.4	49.0	32.6	41.2	51.8
1966	59.4	53.3	37.4	48.8	34.0	40.4	54.1
1967	62.4	55.5	36.5	49.9	33.8	42.5	52.5
1968	64.6	55.8	37.9	50.5	33.5	42.0	45.7
1969	67.9	56.7	39.1	48.3	34.9	44.3	48.7
1970	72.7	62.0	41.3	48.3	42.4	50.6	55.1
1971	72.7	64.4	46.4	51.4	48.1	57.5	62.0
1972	72.9	67.4	55.2	59.1	55.2	64.5	66.6
1973	74.2	69.2	68.6	72.8	71.2	73.1	68.5
1974	84.1	80.1	81.7	77.6	79.4	77.6	81.1
1975	91.4	90.3	90.4	100.6	89.8	104.3	102.1
1976	94.6	101.0	88.2	95.2	88.4	90.5	93.4
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	107.3	97.9	126.2	117.0	121.0	115.6	124.0
1979	116.5	103.2	117.9	133.6	136.1	129.5	158.4
1980	129.4	116.2	113.8	156.2	148.1	141.0	213.5
1981	140.6	125.1	121.8	138.7	125.3	126.1	202.0
Hourly Compensation (a)							
1963	40.4	29.4	9.8	21.7	14.8	18.3	29.6
1964	42.0	30.6	11.0	23.3	15.9	20.4	31.6
1965	42.9	32.1	12.4	25.1	17.5	21.8	34.7
1966	44.8	34.6	13.6	26.7	18.8	22.8	37.7
1967	47.0	37.3	15.3	28.9	19.9	25.4	38.2
1968	50.4	40.0	17.9	32.6	21.1	27.1	35.6
1969	53.9	43.0	21.3	32.3	23.4	30.7	38.9
1970	57.6	47.8	25.4	33.9	29.0	36.8	44.4
1971	61.1	53.1	30.3	38.0	34.4	43.1	51.9
1972	64.4	58.1	40.1	46.2	41.9	52.3	60.1
1973	69.1	63.4	55.0	60.0	57.2	66.4	65.6
1974	76.4	75.0	67.1	66.2	67.7	73.9	78.3
1975	85.5	82.4	77.1	88.5	80.2	95.0	96.6
1976	92.4	97.1	82.3	90.6	84.0	89.5	91.9
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	108.2	99.4	136.1	123.1	125.6	119.1	128.0
1979	118.8	106.6	138.5	148.2	148.2	143.1	168.9
1980	131.6	117.7	142.6	174.4	163.1	164.8	228.9
1981	146.2	127.6	157.1	158.6	141.5	150.3	229.0
Output Per Man Hour (Productivity)							
1963	69.0	58.0	28.1	46.1	45.8	44.9	60.6
1964	72.4	60.6	31.8	48.5	50.3	47.6	64.9
1965	74.6	62.9	33.1	51.3	53.5	52.9	67.0
1966	75.4	65.1	36.5	54.9	55.4	56.4	69.6
1967	75.4	67.1	41.9	57.9	59.0	59.7	72.7
1968	78.1	71.7	47.1	64.5	63.0	64.5	78.0
1969	79.4	75.9	54.5	66.8	66.9	69.4	79.9
1970	79.2	77.0	61.4	70.2	68.5	72.7	80.5
1971	84.1	82.5	65.3	73.9	71.6	74.9	83.7
1972	88.3	86.2	72.7	78.2	75.9	81.1	90.3
1973	93.1	91.6	80.2	82.5	80.4	90.9	95.8
1974	90.9	93.6	82.1	85.3	85.2	95.3	96.5
1975	93.5	91.2	85.3	88.0	89.3	91.1	94.6
1976	97.7	96.1	93.3	95.2	95.0	98.9	98.4
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.9	101.6	107.9	105.3	103.8	103.0	103.2
1979	102.0	103.3	117.4	111.0	108.9	110.5	106.7
1980	101.7	101.3	125.4	111.7	110.1	116.9	107.2
1981	104.0	101.9	129.1	114.3	113.0	119.2	113.4

r - Revised.

(a) U.S. dollar basis.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

COST RECOVERY ALLOWABLE FOR TAX PURPOSES ON MACHINERY AND EQUIPMENT

(Percent of Original Cost)

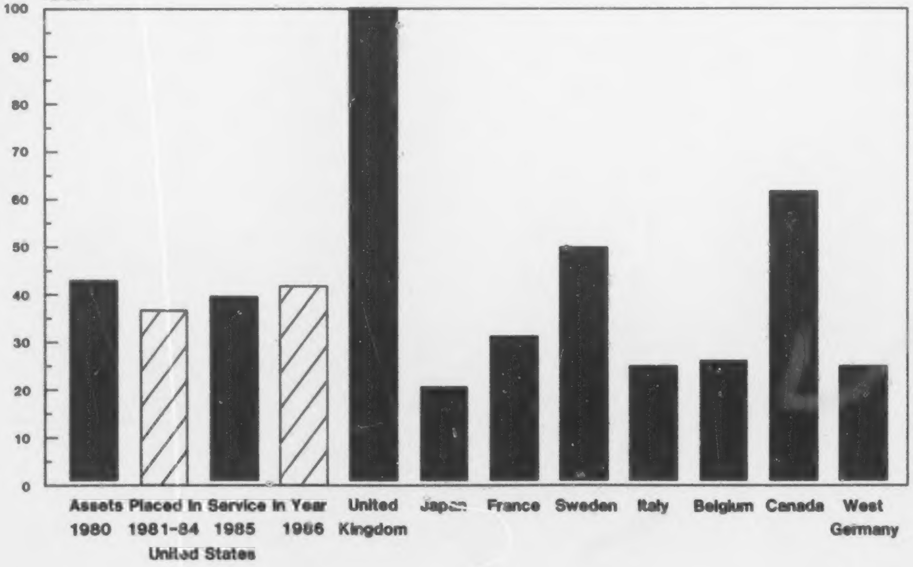
Country	First Year	Third Year	Seventh Year
U.S.: Asset placed in service in year:			
1980	42.8	72.5	104.7
1981-1984	36.7	79.7	121.7
1985	39.7	97.7	121.7
1986	41.7	97.7	121.7
United Kingdom	100.0	100.0	100.0
Japan	20.6	50.0	80.1
France	31.3	67.6	94.6
Sweden	50.0	85.7	120.0
Italy	25.0	75.0	100.0
Belgium	26.0	54.8	95.0
Canada	61.7	108.2	108.2
Netherlands	24.6	44.6	84.6
West Germany	25.0	57.8	86.7
Australia	28.0	48.0	88.0

Note: These capital cost recovery allowances are based on statutory or other published provisions of law. As such they do not reflect informal or ad hoc arrangements that are frequently available in foreign countries—but not in the U.S.—to increase the rate of cost recovery actually allowed to industrial producers in those countries. U.S. figures reflect the phasing-in of the Accelerated Capital Cost Recovery System enacted in the 1981 Tax Act.

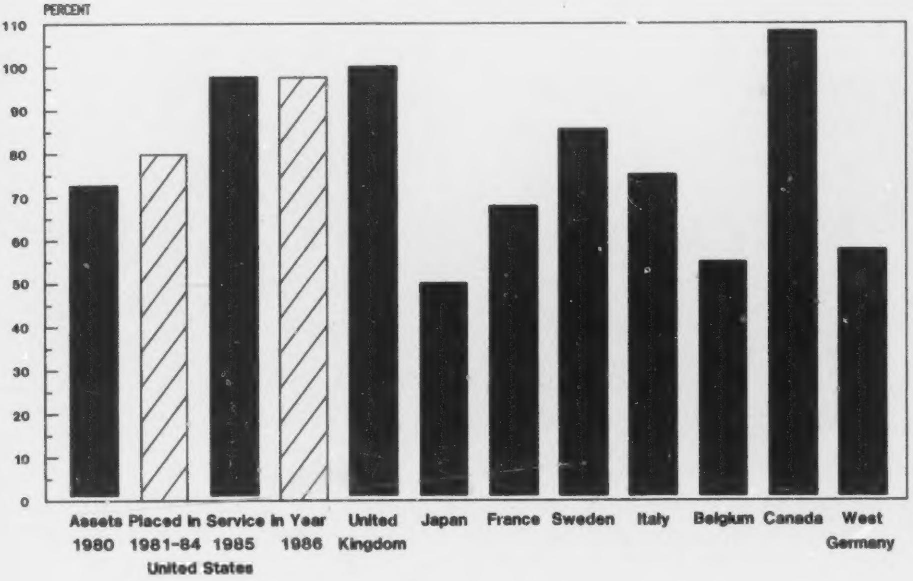
Source: Report of the President's Task Force on Business Taxation, September 1970, pages 28-29 updated by Price Waterhouse & Company. The most recent data is for the year 1981.

Cost recovery allowable for tax purposes includes depreciation as well as any tax credits. Where credits are available, total allowable cost recovery exceeds 100% of the original purchase cost. The rate of depreciation determines how quickly these costs are recovered. The percent values as stated are based on accelerated depreciation rates applicable in each country. At the end of the depreciation period, the taxable profits of the enterprise will have been reduced by the allowable cost recovery. The actual tax savings will depend on the tax rate prevailing in the specific country.

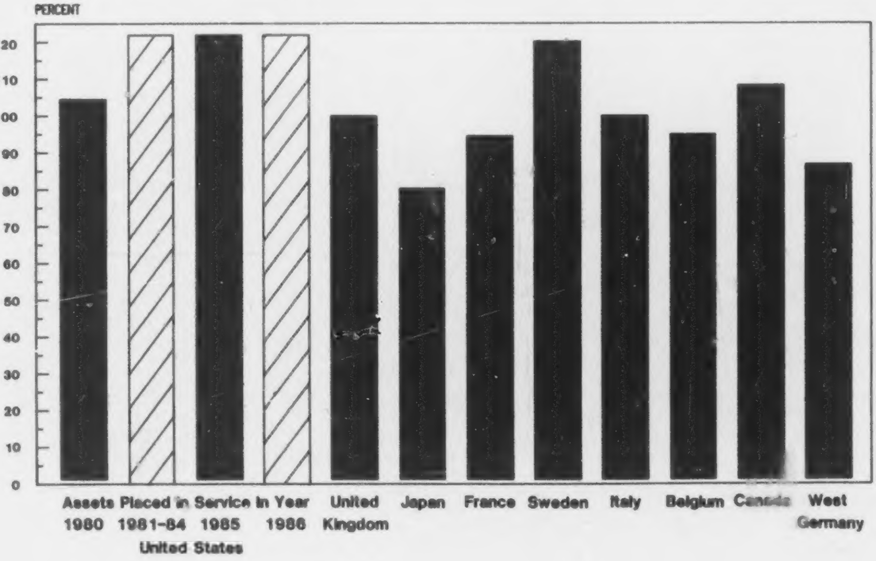
FIRST TAXABLE YEAR



THIRD TAXABLE YEAR



SEVENTH TAXABLE YEAR



FEDERAL, STATE AND LOCAL TAX REVENUES AS PERCENT OF GNP, 1979

Selected Countries

Country	Total	Sales & Excise (a)	Social Security Total (b)	Corporate Income	Non-Corporate Income (b)	Other (d)
Belgium	44.61%	11.24%	13.15%	2.78%	15.77%	1.67%
Canada	32.63	8.01	3.60	3.70	10.79	6.54
Denmark	45.26	16.71	.69	1.40	22.78	3.68
France	40.82	12.44	17.46	1.93	5.09	3.91
Italy	29.97	7.99	11.01	2.52	6.92	1.53
Japan	25.18	3.80	7.37	4.11	5.93	3.97
Luxembourg	35.34	6.18	10.45	6.50	9.65	2.56
Netherlands	45.13	10.41	17.19	2.63	12.01	2.90
Sweden	50.17	11.27	13.60	1.55	21.28	2.48
Switzerland	29.76	5.56	9.23	1.80	10.49	2.68
United Kingdom	33.33	8.40	5.78	2.55	10.44	6.17
United States	29.95	4.17	7.35	3.23	10.55	3.65
West Germany	37.55	9.55	12.79	2.26	10.86	2.09

(a) Includes general sales, value added, and specific excise taxes.
(b) Includes contributions of employers, employees, and self-employed.
(c) Includes income taxes on individual and unincorporated enterprise.
(d) Includes taxes on net wealth and immovable property, taxes and stamp duties on gifts, inheritances, etc.

Source: "Revenue Statistics of OECD Member Countries, 1968-1979."

SOCIAL SECURITY TAX REVENUES AS PERCENT OF GNP, 1979

Selected Countries

Country	Total (a)	Employees	Employers	Self-Employed and Other
Belgium	13.15%	3.71%	8.38%	1.06%
Canada	3.60	NA	NA	NA
Denmark	.69	.45	.24	.00
France	17.46	4.33	11.98	1.15
Italy	11.01	1.82	8.67	.51
Japan	7.37	NA	NA	NA
Luxembourg	10.45	4.07	5.75	.63
Netherlands	17.19	7.32	7.79	2.08
Sweden	13.60	.00	13.02	.58
Switzerland	9.23	4.98	3.12	1.13
United Kingdom	5.78	2.19	3.45	.14
United States	7.35	2.79	4.35	.21
West Germany	12.79	5.69	6.86	.24

NA - Not Available.

(a) The category is broadly defined to include all tax payments to institutions of general government providing social welfare benefits, provided they are levied as a function of pay or as a fixed amount per person. Thus, for the United States, this category includes contributions to the railroad retirement fund, unemployment insurance fund, workmen's compensation fund, and civil service retirement program in addition, of course, to the more familiar social security payments made pursuant to the Federal Insurance Contributions Act (FICA).

Source: "Revenue Statistics of OECD Member Countries, 1968-1979."

3

U. S. MACHINE TOOL INDUSTRY

The "Machine Tool Industry" actually consists of two industries according to the government's Standard Industrial Classification system (SIC); Metal Cutting Machine Tools (SIC 3541) and Metal Forming Machine Tools (SIC 3542).

The distinction between "industries" and "products" should be clearly kept in mind to avoid confusion in studying the statistical data in this Handbook. In brief, the machine tool industry produces not only machine tools but other products. The reverse of this is also true—not all machine tools are produced by the machine tool industry—some other industries also produce machine tools.

The machine tool industry is made up of the establishments whose "primary products" are machine tools. Data on shipments by the machine tool industry covers the totality of the shipments of the establishments in the industry. This means that not only the machine tools but also "secondary products"—products that are generally produced by other industries—are covered. Such secondary products may be tooling, machine tool accessories, abrasive products, wood- or plastic-working machines, or a variety of other products.

To measure the degree to which an industry produces its primary and secondary products, the Census Bureau has developed a "primary specialization ratio" which describes the proportion of total product shipments that are "primary products." For the metal cutting industry, this specialization ratio was 87%, for 1977. This means that 87% of the products shipped by this industry were metal cutting machine tools and 13% were the products of other industries. For metal forming, the corresponding figures are 90%, and 10%.

The Bureau of the Census reports not only "industry" totals but also "product" totals. To obtain a product total, it adds to the machine tools produced by the machine tool industry all the machine tools produced by other industries as secondary products.

In addition to the industry specialization ratio described above, the Census has developed a ratio to describe the proportion of primary products produced by the establishments classified in the industry to total shipments of such products by all manufacturing establishments. This ratio is called the "coverage ratio." In 1977, the coverage ratio in metal cutting was 92%, in metal forming 87%. This means that the metal cutting industry produced 92% of all metal cutting machine tools produced in the U.S., the metal forming industry 87% of all American metal forming machine tools.

The data in Chapter 3 deal exclusively with the machine tool INDUSTRY. Chapter 4 deals with PRODUCTS—total machine tool orders and shipments. As already indicated, industry data are based on the Standard Industrial Classification system. This system was developed to classify establishments by type of activity—it covers the entire field of economic activities. The system is structured by digits. The first two digits identify the major industry group, the third digit identifies the industry group, and the fourth digit identifies the industry. The fifth, sixth, and seventh digits are used to define product classes (fifth) and individual products (sixth and seventh). For example:

Industries	Major Group 35:	Machinery, Except Electrical,
	Group 354:	Metalworking Machinery, and Equipment,
	Industry 3541:	Machine Tools, Metal Cutting Types,
Products	Product Clas 35413:	Gear Cutting Machines,
	Products 3541371:	Gear Tooth Finishing Machines.

Size of the Industry

The machine tool industry is relatively small compared to other U.S. industries. Many of the larger industrial corporations have more employees and a higher value of product shipments than the entire machine tool industry.

Currently, the industry employs around 95,000 people with shipments of both primary and secondary products of over $4 billion. In "good" years, the figure may be some 20% higher, in "poor" years it may fall substantially.

While the most recent Census of Manufactures (1977) reports more than 1,300 establishments in SIC 3541 and SIC 3542, estimates by the NMTBA and Census Bureau indicate that approximately 40% of these plants primarily manufacture machine tool accessories, dies, tools, jigs and fixtures rather than machine tools. According to the 1977 Census, two-thirds of these establishments had fewer than 20 employees.

Location of the Industry*

During the 19th century, the machine tool industry was located almost entirely in New England. Its center moved southward into the Middle Atlantic States and Pennsylvania and then west into Ohio and other parts of the Middle West as the 1800's drew to a close. Development and growth were closely related to the growth of other industries such as textile machinery, small arms, watches and clocks, ships, railroads, farm machinery, and bicycles. By 1900, Cincinnati had become the leading machine tool center, Philadelphia was second, Providence, R.I., third. In the 1920's the rapid growth of the automobile industry accounted for the rapid growth of machine tool production in Michigan and Illinois. The decline of Pennsylvania as a machine tool producer was closely related to the decline of the locomotive. Today, the leading metal cutting machine tool producing states are Ohio, Michigan, Illinois, Connecticut, New York and Wisconsin, and the leading metal forming machine tool producers are Illinois, Ohio, Michigan, New York, and Connecticut.

Sources of Industry Data

Data on the machine tool industry comes from the Census of Manufactures (which takes place every five years) and the Annual Survey of Manufactures. The Census is based on reports from individual establishments and is very detailed. However, the Census suffers from several shortcomings. It focuses primarily on large establishments, thus data on smaller establishments are less reliable. Also, the Census is published with a considerable time lag. Because 1977 was a Census year and because of the time lag in the publication of the Census data, many of the charts and tables in this chapter were previously published using preliminary Census statistics. The final Census data were published in early 1981 and all charts and tables citing the Census have been revised to reflect these final statistics.

In general, the industry finds that its own data, and those released quarterly by the government as "Current Industrial Reports" (MQ-35W), are more useful and timely. The main value of the 5-year Census lies in the broader coverage and in the fact that shipment, employment, compensation, and other data are all available for the same population. This permits the calculation of ratios otherwise not available. The Annual Survey of Manufactures is based on sample surveys and covers fewer items than the Census. It is also published with a considerable delay between the time of data collection and distribution.

THE MACHINE TOOL INDUSTRY (a)
General Statistics, 1958 to Date

Year	Establishments		Employees (Number)	Value Added by Manufacture	Cost of Materials	Value of Shipments
	Total	With 20 or More Employees		(Millions of Dollars)		
TOTAL INDUSTRY, SIC 3541 and 3542						
1958	918	378	75,366	$ 597.0	$ 347.8	$ 997.5
1959	NA	NA	75,091	737.4	403.3	1,111.5
1960	NA	NA	81,200	815.8	468.7	1,265.7
1961	NA	NA	78,108	771.8	456.4	1,241.9
1962	NA	NA	82,251	935.8	513.7	1,430.3
1963	1,167	415	83,136	980.6	547.0	1,502.2
1964	NA	NA	88,079	1,154.7	678.7	1,790.7
1965	NA	NA	96,344	1,342.6	813.5	2,107.2
1966	NA	NA	108,174	1,666.3	981.3	2,553.8
1967	1,253	506	116,400	1,828.5	1,062.3	2,841.2
1968	NA	NA	112,200	1,830.4	988.9	2,817.3
1969	NA	NA	110,600	1,894.6	1,034.7	2,834.8
1970	NA	NA	100,200	1,581.7	992.6	2,597.8
1971	NA	NA	78,400	1,183.7	751.2	2,018.8
1972	1,277	437	76,600	1,319.4	821.6	2,111.7
1973	NA	NA	86,[illegible]00	1,760.6	1,134.9	2,777.3
1974	NA	NA	94,[illegible]	2,250.7	1,523.3	3,579.8
1975	NA	NA	88,800	2,258.6	1,533.5	3,834.4
1976	NA	NA	81,000	2,285.2	1,286.2	3,566.9
1977	1,343	469	83,200	2,592.9	1,493.6	3,949.7
1978	NA	NA	89,500	3,[illegible]08.3	1,994.1	4,977.8
1979(p)	NA	NA	96,100	3,837.8	2,423.9	6,052.5

NA - Not available. p - Preliminary.

(a) The machine tool industry (Standard Industrial Classification SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures".

THE MACHINE TOOL INDUSTRY (a)
General Statistics for Selected Years
Metal Cutting, 1937 to Date
Metal Forming, 1958 to Date

Year	Establishments Total	Establishments With 20 or More Employees	Employees (Number)	Value Added by Manufacture (Millions of Dollars)	Cost of Materials (Millions of Dollars)	Value of Shipments (Millions of Dollars)
METAL CUTTING MACHINE TOOL INDUSTRY, SIC 3541						
1937	205	NA	NA	$ 134.2	$ 59.5	$ 202.7
1939	224	NA	NA	155.9	65.3	221.3
1947	315	NA	70,001	343.2	150.7	493.9
1954	639	NA	80,959	743.6	377.5	1,171.5
1958	627	231	52,864	421.0	217.7	679.8
1962	NA	NA	58,855	671.0	333.0	982.1
1963	801	269	61,058	699.3	381.6	1,050.8
1965	NA	NA	70,827	993.6	559.2	1,524.4
1966	NA	NA	79,767	1,234.2	669.4	1,826.1
1967	903	338	87,200	1,391.3	766.9	2,127.2
1968	NA	NA	84,300	1,377.1	718.9	2,099.1
1969	NA	NA	82,600	1,441.5	744.5	2,108.3
1970	NA	NA	71,300	1,112.1	664.0	1,821.7
1971	NA	NA	54,000	819.8	473.2	1,351.1
1972	894	275	52,500	901.7	536.3	1,418.1
1973	NA	NA	59,900	1,214.1	764.1	1,891.1
1974	NA	NA	65,000	1,617.0	1,017.9	2,480.5
1975	NA	NA	62,800	1,640.3	1,050.3	2,727.8
1976	NA	NA	58,100	1,664.1	852.3	2,496.2
1977	917	306	59,500	1,871.0	1,049.6	2,819.1
1978	NA	NA	64,300	2,267.0	1,417.7	3,611.8
1979(p)	NA	NA	69,100	2,833.8	1,736.9	4,389.0
METAL FORMING MACHINE TOOL INDUSTRY, SIC 3542						
1958	291	147	22,502	$ 176.0	$ 130.1	$ 317.7
1962	NA	NA	23,396	265.8	180.7	448.2
1963	366	146	22,078	281.3	165.4	441.4
1965	NA	NA	25,517	349.0	254.3	582.8
1966	NA	NA	28,407	432.1	311.9	727.7
1967	350	168	29,200	437.2	295.4	714.0
1968	NA	NA	27,900	453.3	270.0	718.2
1969	NA	NA	28,000	453.1	290.2	726.5
1970	NA	NA	28,900	469.6	328.6	776.1
1971	NA	NA	24,400	363.9	278.0	667.7
1972	383	162	24,100	417.7	285.3	693.6
1973	NA	NA	27,000	546.5	370.8	886.2
1974	NA	NA	29,000	633.7	505.4	1,099.3
1975	NA	NA	26,000	618.3	483.2	1,106.6
1976	NA	NA	22,900	621.1	433.9	1,070.7
1977	426	163	23,700	721.9	444.0	1,130.6
1978	NA	NA	25,200	841.3	576.4	1,366.0
1979(p)	NA	NA	27,000	1,004.0	687.0	1,663.5

NA - Not Available. p - Preliminary.

(a) The machine tool industry (Standard Industrial Classifications SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures".

LOCATION OF THE MACHINE TOOL INDUSTRY (c)
Establishments, Employees, Value Added, Shipments, by Region
1958 to 1977

Region	Establishments Total	Establishments With 20 or More Employees	Employees (Number)	Value Added by Manufacture (Million Dollars)	Value of Shipments (Million Dollars)
U.S. TOTAL					
1958	918	378	75,366	$ 597	$ 998
1963	1,167	415	83,136	980	1,502
1967	1,253	506	116,400	1,828	2,841
1972	1,277	437	76,600	1,319	2,114
1977	1,343	469	83,200	2,593	3,950
NEW ENGLAND					
1958	122	60	14,376	106	171
1963	150	52	16,934	183	273
1967	149	68	25,300	366	550
1972	140	52	2,000(a)	32(a)	48(a)
1977	155	56	D	D	D
MIDDLE ATLANTIC					
1958	176	60	11,095	82	131
1963	251	68	11,618	148	212
1967	239	71	13,400	215	299
1972	218	64	10,400	175	270
1977	197	57	7,000(b)	205(b)	286(b)
EAST NORTH CENTRAL					
1958	453	214	45,740	374	634
1963	545	239	49,415	592	926
1967	578	270	67,500	1,100	1,764
1972	620	240	45,500	793	1,308
1977	595	252	48,200	1,535	2,389
WEST NORTH CENTRAL					
1958	42	16	1,520	12	21
1963	44	16	1,085	11	16
1967	46	22	2,600	38	57
1972	50	25	2,400	43	65
1977	52	23	D	D	D
SOUTH					
1958	34	11	764	8	11
1963	47	12	1,068	13	19
1967	61	29	3,200	44	63
1972	82	21	1,000(a)	19(a)	30(a)
1977	40	12	975E	5(b)	7(b)
WEST					
1958	91	17	1,871	15	27
1963	130	28	3,016	35	55
1967	180	46	4,400	67	109
1972	168	36	2,000(a)	39(a)	64(a)
1977	162	40	3,000E	65(b)	96(b)

D - Withheld to avoid disclosure. E - Estimate.

(a) Includes metal forming data only, metal cutting data not given to avoid disclosure.
(b) Includes metal cutting data only, metal forming data withheld to avoid disclosure.
(c) Due to a change of methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
1958 to 1977

Region	Establishments		Employees (Number)	Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees		(Million Dollars)	
U.S. TOTAL					
1958	627	231	52,864	$ 421	$ 680
1963	801	269	61,058	699	1,061
1967	903	338	87,200	1,391	2,127
1972	894	275	52,500	902	1,418
1977	917	306	59,500	1,871	2,819
NEW ENGLAND					
1958	90	42	12,134	89	141
1963	111	39	14,853	160	238
1967	120	51	22,900	329	492
1972	109	40	D	D	D
1977	122	44	D	D	D
MIDDLE ATLANTIC					
1958	109	27	6,322	48	69
1963	163	40	7,106	89	120
1967	163	44	8,100	145	189
1972	145	35	6,500	115	166
1977	125	33	7,000	205	286
EAST NORTH CENTRAL					
1958	316	141	32,509	267	441
1963	387	161	36,845	425	662
1967	428	191	49,900	824	1,303
1972	438	154	31,000	538	875
1977	440	179	34,600	1,105	1,717
WEST NORTH CENTRAL					
1958	25	9	912	7	12
1963	24	11	547	5	8
1967	26	10	1,600	25	36
1972	29	13	1,500	27	41
1977	28	13	D	D	D
SOUTH					
1958	22	7	465	5	7
1963	26	4	463	6	9
1967	37	15	2,200	31	41
1972	52	12	D	D	D
1977	17	2	200	5	7
WEST					
1958	65	5	522	5	8
1963	90	14	1,244	15	24
1967	129	27	2,500	38	66
1972	121	21	D	D	D
1977	104	18	1,700	65	96

D - Withheld to avoid disclosure.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
1958 to 1977

Region	Establishments: Total	Establishments: With 20 or More Employees	Employees (Number)	Value Added by Manufacture (Million Dollars)	Value of Shipments (Million Dollars)
U.S. TOTAL					
1958	291	147	22,502	$176	$ 318
1963	366	146	22,078	281	441
1967	350	168	29,200	437	714
1972	383	162	24,100	418	696
1977	426	163	23,700	722	1,131
NEW ENGLAND					
1958	32	18	2,242	17	30
1963	39	13	2,081	23	35
1967	29	17	2,400	37	58
1972	31	12	2,000	32	48
1977	33	12	D	D	D
MIDDLE ATLANTIC					
1958	67	33	4,773	34	62
1963	88	28	4,512	59	92
1967	76	27	5,300	70	110
1972	73	29	3,900	60	104
1977	72	24	D	D	D
EAST NORTH CENTRAL					
1958	137	73	13,231	107	193
1963	158	78	12,570	167	264
1967	150	79	17,600	276	461
1972	182	86	14,500	256	433
1977	155	73	13,600	430	672
WEST NORTH CENTRAL					
1958	17	7	608	5	9
1963	20	5	538	6	8
1967	20	12	1,000	13	21
1972	21	12	900	16	24
1977	24	10	D	D	D
SOUTH					
1958	12	4	299	3	4
1963	21	8	605	7	10
1967	24	14	1,000	13	22
1972	30	9	1,000	19	30
1977	23	10	955E	D	D
WEST					
1958	26	12	1,349	10	19
1963	40	14	1,772	20	31
1967	51	19	1,900	[illegible]	43
1972	47	15	2,000	[illegible]	64
1977	58	22	1,300E	D	D

D - Withheld to avoid disclosure. E - Estimate.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1 35(C)" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY
General Statistics by Selected States
1972 to 1977

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1972		
California	105	16	1,500	$ 24	$ 43
Connecticut	50	18	(c)	D	D
Florida	7	1	100	2	2
Illinois	111	36	6,400	114	177
Indiana	25	5	900	13	20
Kansas	3	2	100	2	3
Kentucky	8	2	200	2	5
Massachusetts	34	10	(c)	D	D
Michigan	171	56	7,400	169	279
Minnesota	9	4	600	9	14
Missouri	9	4	500	10	14
New Jersey	43	5	400	7	11
New York	65	21	4,700	84	122
Ohio	93	38	12,400	186	312
Pennsylvania	37	9	1,500	24	33
Rhode Island	14	6	(b)	D	D
Tennessee	5	2	(a)	D	D
Texas	10	5	(b)	D	D
Vermont	3	3	(c)	31	43
Wisconsin	38	19	3,900	56	87
STATE			1977		
California	95	16	1,500	$ 60	$ 89
Connecticut	46	18	4,600	148	234
Illinois	94	39	6,500	196	291
Indiana	25	8	1,400	39	57
Iowa	6	4	500	12	21
Massachusetts	37	10	2,200	66	92
Michigan	190	74	9,100	353	566
Minnesota	20	7	1,300	40	58
New Jersey	31	6	400	10	15
New York	52	16	4,700	148	204
Ohio	95	40	13,900	389	624
Pennsylvania	42	11	1,900	48	66
Rhode Island	20	7	2,400	62	82
Texas	17	2	200	5	7
Vermont	6	4	2,800	87	117
Washington	9	2	200	5	7
Wisconsin	36	18	3,700	128	180

D - Withheld to avoid disclosure.

(a) 250-499 Employees.
(b) 1,000-2,499 Employees.
(c) 2,500 Employees and over.

Source: U.S. Bureau of the Census, "Census of Manufactures 1972, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY
General Statistics by Selected States
1972 to 1977

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1972		
California	34	10	(c)	D	D
Connecticut	22	10	1,800	$ 29	$ 44
Florida	7	2	200	2	4
Georgia	3	2	(b)	D	D
Indiana	12	8	500	9	16
Illinois	53	28	6,100	91	173
Massachusetts	6	1	(a)	D	D
Michigan	69	23	2,600	50	86
Minnesota	7	4	400	8	11
Missouri	7	2	200	2	3
New Jersey	23	8	400	6	10
New York	29	13	2,300	37	61
North Carolina	3	1	(b)	D	D
Ohio	39	26	5,100	103	155
Pennsylvania	21	8	1,200	17	33
Texas	9	2	200	3	5
Washington	3	1	(b)	D	D
Wisconsin	9	1	100	2	3
STATE			1977		
California	47	16	1,100	$ 37	$ 62
Colorado	8	4	400	10	17
Connecticut	24	10	1,800	50	72
Illinois	52	25	6,400	177	276
Indiana	11	7	600	18	31
Kansas	5	3	300	7	12
Michigan	58	22	2,000	68	110
Missouri	12	6	300	5	8
New Yo[illegible]	29	11	2,200	65	96
Ohio	34	19	4,600	167	255
Penn[illegible]	19	7	900	37	59
Texas	10	4	200	4	6

D - Withheld to avoid disclosure.

(a) 150-249 Employees.
(b) 250-499 Employees.
(c) 1,000-2,499 Employees.

Source: U.S. Bureau of the Census, "Census of Manufactures 1972, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

THE MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1958	1963	1967	1972	1977
Number of Companies	890	1,146	1,209	NA	NA
Number of Establishments	918	1,167	1,253	1,277	1,343
Number of Employees	75,366	83,136	116,400	76,600	83,100
1 to 4 Employees					
Establishments	273	375	336	380	434
Employees	571	714	500	800	800
5 to 9 Employees					
Establishments	140	191	189	212	262
Employees	964	1,295	1,300	1,500	1,700
10 to 19 Employees					
Establishments	127	186	222	248	178
Employees	1,738	2,612	3,100	3,400	2,400
20 to 49 Employees					
Establishments	153	182	218	194	219
Employees	4,903	5,643	6,500	6,000	6,700
50 to 99 Employees					
Establishments	77	96	111	89	98
Employees	5,356	6,455	7,700	6,200	6,700
100 to 249 Employees					
Establishments	79	67	79	83	75
Employees	12,666	10,620	12,700	12,500	11,500
250 to 499 Employees					
Establishments	31	31	43	37	41
Employees	10,900	11,249	15,100	12,600	14,800
500 to 999 Employees					
Establishments	26	22	30	24	27
Employees	20,875	15,583	21,400	17,600	21,700(a)
1000 to 2499 Employees					
Establishments	11	14	22	8	8
Employees	17,393	19,236	35,500	16,200(b)	16,600(b,d)
2500 Employees or More					
Establishments	1	3	3	2(b)	1
Employees	D	9,729	12,400	NA	(c)

D - Withheld to avoid disclosure. NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.
(b) Includes only metal cutting to avoid disclosure.
(c) The number of employees is included in the "1000-2499 Employees" category.
(d) Also includes data for the "2500 Employees or More" (metal cutting) category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

THE METAL CUTTING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1958	1963	1967	1972	1977
Number of Companies	611	784	865	NA	NA
Number of Establishments	627	801	903	894	917
Number of Employees	52,864	61,058	87,200	52,500	59,400
1 to 4 Employees					
Establishments	213	276	256	281	315
Employees	435	529	400	600	600
5 to 9 Employees					
Establishments	99	127	142	158	184
Employees	692	840	1,000	1,100	1,200
10 to 19 Employees					
Establishments	84	129	167	180	112
Employees	1,130	1,803	2,300	2,500	1,500
20 to 49 Employees					
Establishments	88	118	145	126	144
Employees	2,878	3,607	4,300	3,900	4,400
50 to 99 Employees					
Establishments	47	56	74	55	67
Employees	3 221	3,727	5,200	3,800	4,600
100 to 249 Employees					
Establishments	48	44	49	47	40
Employees	7,756	6,912	8,100	7,000	6,300
250 to 499 Employees					
Establishments	21	22	30	24	28
Employees	7,408	7,713	10,600	8,400	10,300
500 to 999 Employees					
Establishments	17	15	20	14	19
Employees	11,951	10,664	13,900	9,200	13,800
1000 to 2499 Employees					
Establishments	9	11	17	7	7
Employees	17,393(a)	15,534	28,900	16,200(a)	16,600(a)
2500 Employees or More					
Establishments	1	3	3	2	1
Employees	D(b)	9,729	12,400	D(b)	D(b)

D - Withheld to avoid disclosure. NA - Not Available.

(a) Also includes data for the "2500 Employees or More" category.

(b) The number of employees is included in the "1000 to 2499 Employees" category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

THE METAL FORMING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1958	1963	1967	1972	1977
Number of Companies	279	362	344	NA	NA
Number of Establishments	291	366	350	383	426
Number of Employees	22,502	22,078	29,200	24,100	23,700
1 to 4 Employees					
Establishments	60	99	80	99	119
Employees	136	185	100	200	200
5 to 9 Employees					
Establishments	41	64	47	54	78
Employees	272	455	300	400	500
10 to 19 Employees					
Establishments	43	57	55	68	66
Employees	608	809	800	900	900
20 to 49 Employees					
Establishments	65	64	73	68	75
Employees	2,025	2,036	2,200	2,100	2,300
50 to 99 Employees					
Establishments	30	40	37	34	31
Employees	2,135	2,728	2,500	2,400	2,100
100 to 249 Employees					
Establishments	31	23	30	36	35
Employees	4,910	3,708	4,600	5,500	5,200
250 to 499 Employees					
Establishments	10	9	13	13	13
Employees	3,492	3,536	4,500	4,200	4,500
500 to 999 Employees					
Establishments	9	7	10	10	8
Employees	8,924(a)	4,919	7,500	8,400(a)	7,900(a)
1000 to 2499 Employees					
Establishments	2	3	5	1	1
Employees	D(b)	3,702	6,600	D(b)	D(b)
2500 Employees or More					
Establishments	—	—	—	NA	NA
Employees	—	—	—	NA	NA

D - Withheld to avoid disclosure. NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.

(b) The number of employees is included in the "500 to 999 Employees" category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

INVENTORIES OF THE MACHINE TOOL INDUSTRY
End of Year, Selected Years, 1958 to Date
(Millions of Dollars)

	Total Machine Tool Industry	Metal Cutting SIC 3541	Metal Forming SIC 3542
TOTAL INVENTORIES			
1958	$ 335.5	$ 231.8	$103.7
1963	440.5	316.3	124.2
1967	743.1	535.3	207.8
1970	820.5	562.9	257.6
1971	726.0	492.8	233.2
1972	724.9	482.2	242.7
1973	885.7	591.9	293.8
1974	1,150.0	786.2	363.8
1975	1,100.4	737.9	362.5
1976	1,048.3	735.4	312.9
1977	1,238.0	878.4	359.6
1978	1,434.0	1,012.3	421.7
1979(p)	1,689.2	1,242.2	447.0
Finished Products			
1958	92.2	65.6	26.6
1963	116.2	82.3	33.9
1967	158.9	112.1	46.8
1970	197.7	135.5	62.2
1971	186.1	123.2	62.9
1972	173.6	112.8	60.7
1973	174.7	111.0	63.7
1974	223.8	148.3	75.5
1975	244.6	166.0	78.6
1976	233.5	168.9	64.6
1977	264.7	184.2	80.5
1978	282.4	199.7	82.7
1979(p)	312.1	222.3	89.8
Work in Process			
1958	166.4	121.5	44.9
1963	234.5	176.2	58.3
1967	442.0	329.5	112.5
1970	458.1	326.4	131.7
1971	385.5	278.3	107.2
1972	395.2	279.8	115.4
1973	521.2	371.4	149.8
1974	678.2	492.6	185.6
1975	618.1	447.7	170.4
1976	596.3	443.8	152.5
1977	717.6	537.5	180.1
1978	868.5	642.3	226.2
1979(p)	1,042.8	812.5	230.3
Materials, Supplies, Fuel, Etc.			
1958	76.9	44.7	32.2
1963	89.7	57.8	31.9
1967	142.2	93.7	48.5
1970	164.7	101.0	63.7
1971	154.4	91.3	63.1
1972	156.2	89.6	66.6
1973	189.8	109.5	80.3
1974	248.0	145.3	102.7
1975	237.7	124.2	113.5
1976	218.4	122.7	95.7
1977	255.7	156.7	99.1
1978	283.1	170.3	112.8
1979(p)	334.3	207.4	126.9

p - Preliminary.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77(1)-35C" and earlier issues; U.S. Bureau of the Census, "Annual Survey of Manufactures." See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
Quantity Used

Material	Unit of Measure	Metal Cutting Industry 1967	Metal Cutting Industry 1972	Metal Cutting Industry 1977	Metal Forming Industry 1967	Metal Forming Industry 1972	Metal Forming Industry 1977
MILL SHAPES							
Carbon Steel	Short Ton	118,700(j)	85,900(i)	NA	184,500(e)	139,100(j)	113,400(a)
Stainless Steel	Short Ton	2,300	900	NA	600	500	100(m)
Other Alloy Steel	Short Ton	29,800	24,500	20,000(o)	15,100	9,600	12,000(n)
Copper and Alloy	000 Lbs.	2,000(d)	600(h,k)	3,800(d,h)	900(f)	300(k)	800(k)
Aluminum and Alloy	000 Lbs.	1,900	1,400(b)	NA	400(g)	NA	1,100
Iron and Steel Scrap	Short Ton	32,200	20,100	6,500	20,500	D	NA
CASTINGS (Rough and Semifinished)							
Iron (Gray & Malleable)	Short Ton	160,200	69,900	77,900(p)	43,500	36,500	NA
Steel		13,100	NA	NA	23,900	11,100	12,400(p)
Aluminum and Alloy	000 Lbs.	NA	NA	NA	1,000	700	2,600(p)
Copper and Alloy	000 Lbs.	1,600	1,100	1,700(p)	2,100	2,600	NA
IRON AND STEEL FORGINGS							
Iron & Steel Forgings	Short Ton	8,400	4,700	5,900(p)	10,100	7,500	8,200(p)
ELECTRIC MOTORS AND GENERATORS							
Fractional	Number	174,400	96,300(c)	1,900(l,p)	NA	900(l)	1,900(l,p)
Integral	Number	110,800	NA	NA	26,200	NA	NA

NA - Not Available. D - Withheld to avoid disclosure.

(a) Excludes structural shapes and all other carbon steel.
(b) Sheet and extrusion only.
(c) Excludes timing motors.
(d) Insulated wire and cable only.
(e) Excludes wire and wire products and sheet and strip.
(f) Excludes plate, sheet and strip and pipe and tube.
(g) Sheet and plate only.
(h) Bare wire only.
(i) Bars and bar shapes, sheet and strip, and plates only.
(j) Bars and bar shapes, sheet and strip, plates, and structural shapes only.
(k) Rod, bar, and mechanical wire and plate, sheet, and strip only.
(l) Timing motors only.
(m) Sheet and strip only.
(n) Excludes bars and bar shapes.
(o) Bars and bar shapes only.
(p) Purchased only.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977, 1972, 1967: Industry Series: Metalworking Machinery and Equipment." See chapter introduction.

PRODUCTS OF THE METAL CUTTING AND FORMING INDUSTRIES
Selected Years
(Values in Millions of Dollars)

Industry and Year					
Metal Cutting Industry (3541)	TOTAL SHIPMENTS	Metal Cutting Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1963	$1,060.8	$ 805.3	$187.9	$ 67.6	81%
1967	2,127.2	1,715.7	269.7	141.8	86
1972	1,418.1	1,135.5	188.9	93.7	86
1977	2,812.7	2,353.9	337.0	121.8	87
Metal Forming Industry (3542)	TOTAL SHIPMENTS	Metal Forming Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1963	$ 441.4	$350.9	$ 57.6	$ 32.9	86%
1967	714.0	568.4	99.5	46.1	85
1972	696.3	583.6	73.1	39.6	89
1977	1,130.6	967.1	111.6	51.9	90

Note: "Primary Product Specialization" is arrived at by dividing "Primary Products" by "Primary Products plus Secondary Products."

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977; Industry Series: Metalworking Machinery and Equipment MC77-1-35C" and earlier issues. See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
(Millions of Dollars)

Material	Metal Cutting Industry 1967	Metal Cutting Industry 1972	Metal Cutting Industry 1977	Metal Forming Industry 1967	Metal Forming Industry 1972	Metal Forming Industry 1977
GRAND TOTAL	$657.3	$454.3	$904 4	$256.6	$253.4	$395.7
MILL SHAPES						
Carbon Steel	35.8	34.4	63.1	34.3	36.7	58.3
Stainless Steel	2.0	3.2	3.0	0.6	.6	.7
Other Alloy Steel	17.0	15.5	23.2	7.1	7.0	12.1
Copper and Alloy	3.8(a)	3.5	5.5	1.0	1.1(a)	2.4
Aluminum and Alloy	1.7	1.4	1.7	1.3	0.8	2.7
Iron and Steel Scrap	1.4	0.9	1.1	0.9	D	0.7
CASTINGS (Rough and Semifinished)						
Iron (Gray and Malleable)	76.6	43.6	84.5	18.7	18.1	29.4
Steel	10.3	4.4	8.7	12.9	8.9	18.8
Aluminum and Alloy	8.3	4.1	6.0	1.1	0.8	2.9
Copper and Alloy	1.8	1.2	2.5	2.2	2.9	1.5
IRON AND STEEL FORGING						
Iron and Steel Forgings	6.7	4.3	8.7	6.9	6.1	11.3
ELECTRICAL MOTORS AND GENERATORS						
Fractional	7.7	4.3	7.0	1.8	0.6	2.7
Integral	21.2	16.3	26.3	11.1	6.6	12.6
BEARINGS						
Ball and Roller	17.2	13.2	18.6	3.1	3.7	7.6
ALL OTHER MATERIALS						
Components, Parts, Etc.	347.2	227.0	478.6	117.9	114.7	151.7
NO BREAKDOWN FURNISHED						
Materials, Parts, Containers and Supplies	97.7	77.2	165.9	35.2	44.8	80.3

NA - Not Available.   D - Withheld to avoid disclosure.

(a) Excludes bare wire, pipe and tube.

Source: U.S. Bureau of the Census "Census of Manufactures, 1977, 1972, 1967: Industry Series: Metalworking Machinery and Equipment," and earlier issues. See chapter introduction.

4

U. S. MACHINE TOOL SHIPMENTS AND ORDERS

This chapter deals with machine tool products shipped by the machine tool industry and other industries.

Up and Down Performance

The machine tool business is highly cyclical, a fact evidenced by historical patterns of new orders, shipments and order backlogs. The dramatic ups and downs in the value of shipments and orders tend to obscure significant changes in the "product mix"; the share of the total comprised by the different major machine tool product categories.

In complete metal cutting machine tool shipments, for instance, milling machines dropped from 14.9% in 1969 to about four-fifths as much in 1981 at 11.9%. Lathes and drilling machines experienced declining relative portions of the market in 1981 while boring, milling, and grinding and polishing machines all registered slight gains in relative shipment values. "Other" metal cutting machines have grown steadily as a share of total metal cutting from 26.4% in 1969 to 41.5% in 1981. This group, which includes transfer and multi-function NC machines, has made up more than one-third of the total value of shipments since 1974.

Data Sources

Census and Annual Survey of Manufactures

The broadest coverage of machine tool shipment data is provided by the Census of Manufactures and the Annual Surveys of Manufactures. Included in these reports are statistics for: the six major categories of metal cutting machine tools (boring, drilling, gear cutting, etc,), machine tools primarily designed for home workshops and laboratories, parts sold separately, and machine tools originating primarily from small-sized plants-not specified by kind and information concerning the value of parts sold separately. Similar broad coverage is given to metal forming machine tools.

The comprehensive Census of Manufactures is taken every five years (those ending in 2 and 7) and the Annual Survey of Manufactures is published in non-Census years. The charts and tables in this chapter were updated with published revised reports from the 1977 Census of Manufactures and the 1978 Annual Survey of Manufactures.

There are two other sources of machine tool shipment data widely used by students of the industry. One is the monthly order and shipment series published by NMTBA. The other is the quarterly "Current Industrial Report, Metalworking Machinery" (MQ35W), published by the U.S. Department of Commerce. The MQ-35W provides more detailed coverage of shipments by product types than the Census or Survey of Manufactures. Both the MQ-35W and the NMTBA estimates are more timely and are published more frequently than either the Census or Annual Survey.

NMTBA Estimates of Orders and Shipments

The NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" is published monthly, normally three or four weeks after the end of the month reported. This report differs from the broader Census report in that it is limited to complete machine tools and excludes the value of: (a) machine tools costing under $2,500, (b) machine tools designed for home workshops, etc., (c) rebuilt machines and (d) parts sold separately.

Machine tool manufacturers representing more than two-thirds of total U.S. machine tool shipments participate in the NMTBA survey. The percentages are based on "benchmark" totals derived from the MQ-35W reports. The figures received each month from respondents are expanded to an estimate of the industry total by NMTBA's Statistical Department.

The MQ-35W Report

The "Current Industrial Report, Metalworking Machinery" (MQ-35W) is published quarterly, usually about three months after the end of the quarter reported, by the Bureau of the Census.

The report covers the number and value of total machine tools shipped by 5- and 7-digit SIC categories for more than 120 different machine tool products. It does not report new orders but does report unfilled orders.

The report is limited to information on complete new machine tools, excluding data for small machine tools designed for home use, etc., and data for rebuilt machines. It lists separately machines with a value of $2,500 and over, and those with a value under $2,500. The MQ-35W figures, excluding machine tools with an average value under $2,500, form the benchmark used for the NMTBA estimates.

The MQ-35W report also includes data on numerically controlled machine tools and on manufacturers' exports. It is intended to cover all manufacturers of machine tool products and thus to cover all shipments.

SHIPMENTS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,377	$1,270	$107	$ 945	$ 858	$ 87	$ 432	$412	$ 20
1957	1,243	1,110	133	900	803	97	343	307	36
1958	591	507	84	438	381	57	153	126	27
1959	616	538	78	441	390	51	175	148	27
1960	744	580	164	541	420	121	203	160	43
1961	751	522	229	541	366	175	210	156	54
1962	821	606	215	613	450	163	208	156	52
1963	896	741	155	639	526	113	257	215	42
1964	1,164	959	205	845	679	166	319	280	39
1965	1,426	1,249	177	1,023	886	137	403	363	40
1966	1,685	1,535	150	1,222	1,098	124	463	437	26
1967	1,806	1,618	188	1,353	1,211	142	453	407	46
1968	1,727	1,563	164	1,358	1,238	120	369	325	44
1969	1,597	1,446	151	1,192	1,077	115	405	369	36
1970	1,443	1,239	204	993	827	166	450	412	38
1971	998	840	158	672	554	118	326	286	40
1972	1,019	894	124	714	627	87	304	267	37
1973	1,501	1,323	178	1,074	935	139	427	388	39
1974	2,031	1,763	267	1,445	1,241	205	585	522	63
1975	2,452	2,033	419	1,879	1,548	331	573	484	89
1976	2,060	1,744	316	1,482	1,270	212	578	474	104
1977	2,281	2,030	251	1,651	1,470	181	630	560	70
1978	3,013	2,689	325	2,189	1,960	228	825	729	96
1979	3,877	3,465	411	2,930	2,605	325	947	860	87
1980	4,692	4,084	608	3,681	3,206	475	1,011	878	133
1981	5,096	4,377	719	4,105	3,553	552	991	824	167

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,298	$1,172	$126	$ 983	$ 882	[illegible]	$315	$290	$25
1957	722	644	78	552	491	[illegible]	170	153	17
1958	427	350	77	299	247	52	128	103	25
1959	748	644	104	541	471	70	207	173	34
1960	744	527	217	535	375	160	209	152	57
1961	772	536	236	591	401	190	181	135	46
1962	815	661	154	571	468	103	244	193	51
1963	1,061	869	192	760	607	153	301	262	39
1964	1,577	1,348	229	1,038	861	177	539	487	52
1965	1,692	1,532	160	1,251	1,122	129	441	410	31
1966	2,074	1,884	190	1,629	1,483	146	445	401	44
1967	1,420	1,272	148	1,134	1,024	110	286	248	38
1968	1,474	1,320	154	1,080	960	120	394	360	34
1969	1,728	1,517	211	1,195	1,033	162	533	484	49
1970	912	733	179	651	507	144	261	226	35
1971	861	747	114	609	524	85	252	223	29
1972	1,412	1,245	167	1,009	877	132	403	368	35
1973	2,613	2,268	345	1,825	1,550	275	787	717	70
1974(r)	2,583	2,185	398	2,017	1,716	301	566	470	96
1975(r)	1,277	1,064	213	916	781	135	361	284	77
1976(r)	2,203	1,961	242	1,662	1,477	185	541	485	56
1977(r)	2,995	2,709	286	2,202	1,981	221	793	729	64
1978(r)	4,349	3,944	405	3,375	3,043	332	973	901	72
1979(r)	5,621	4,856	765	4,495	3,866	629	1,126	991	135
1980(r)	4,754	4,239	515	3,885	3,496	389	870	744	126
1981	2,945	2,563	382	2,228	1,946	282	717	617	100

r - Revised; Metal Forming Net New Order data for 1974-80 was revised by NMTBA in 1981.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders
1956	$1,392	$ 94	$1,298	$1,052	$ 69	$ 983	$ 340	$ 25	$ 315
1957	799	77	722	618	66	552	181	11	170
1958	451	24	427	317	18	299	134	6	128
1959	769	21	748	559	18	541	210	3	207
1960	790	46	744	571	36	535	219	10	209
1961	808	36	772	621	30	591	187	6	181
1962	852	37	815	603	32	571	249	5	244
1963	1,099	38	1,061	790	30	760	309	8	301
1964	1,652	75	1,577	1,084	46	1,038	568	29	539
1965	1,771	79	1,692	1,312	61	1,251	459	18	441
1966	2,217	143	2,074	1,737	108	1,629	480	35	445
1967	1,614	194	1,420	1,292	158	1,134	322	36	286
1968	1,631	157	1,474	1,216	136	1,080	415	21	394
1969	1,910	182	1,728	1,332	137	1,195	578	45	533
1970	1,060	148	912	757	106	651	303	42	261
1971	933	72	861	655	46	609	278	25	252
1972	1,465	53	1,412	1,051	42	1,009	414	11	403
1973	2,773	160	2,613	1,958	132	1,825	815	28	787
1974(r)	2,970	387	2,583	2,283	266	2,017	687	121	566
1975(r)	1,651	374	1,277	1,198	282	916	453	92	361
1976(r)	2,370	167	2,203	1,793	131	1,662	578	37	541
1977(r)	3,153	158	2,995	2,329	127	2,202	824	31	793
1978(r)	4,573	224	4,349	3,559	184	3,375	1,013	40	973
1979(r)	6,063	442	5,621	4,873	378	4,495	1,190	64	1,126
1980(r)	5,381	627	4,754	4,436	551	3,885	946	76	870
1981	3,585	640	2,945	2,799	571	2,228	786	69	717

r - Revised; Metal Forming Net New Order data for 1974-80 was revised by NMTBA in 1981.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

UNFILLED ORDERS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

As of December 31	Total	Metal Cutting	Metal Forming	As of December 31	Total	Metal Cutting	Metal Forming
1956	$ 990	$ 735	$255	1970	$ 706	$ 471	$235
1957	471	388	83	1971	569	408	162
1958	308	249	59	1972	963	702	261
1959	443	350	93	1973	2,074	1,454	621
				1974(r)	2,625	2,025	600
1960	444	344	100				
1961	467	394	73	1975(r)	1,450	1,062	388
1962	463	354	109	1976(r)	1,594	1,243	351
1963	628	475	153	1977(r)	2,308	1,794	515
1964	1,043	669	374	1978(r)	3,643	2,981	663
				1979(r)	5,388	4,546	843
1965	1,311	899	412				
1966	1,701	1,307	394	1980(r)	5,451	4,750	701
1967	1,317	1,089	228	1981	3,300	2,873	427
1968	1,064	810	295				
1969	1,195	812	424				

r - Revised; Metal Forming Net New Order data for 1974-80 was revised by NMTBA in 1981.

Source: NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL CUTTING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders
1956	$1,052	$ 69	$ 983	$ 946	$ 64	$ 882	$106	$ 5	$101
1957	618	66	552	555	64	491	63	2	61
1958	317	18	299	265	18	247	52	0	52
1959	559	18	541	486	15	471	73	3	70
1960	571	36	535	408	33	375	163	3	160
1961	621	30	591	425	24	401	196	6	190
1962	603	32	571	494	26	468	109	6	103
1963	790	30	760	632	25	607	158	5	153
1964	1,084	46	1,038	896	35	861	188	11	177
1965	1,312	61	1,251	1,175	53	1,122	137	8	129
1966	1,737	108	1,629	1,580	97	1,483	157	11	146
1967	1,292	158	1,134	1,173	149	1,024	119	9	110
1968	1,216	136	1,080	1,091	131	960	125	5	120
1969	1,332	137	1,195	1,160	127	1,033	172	10	162
1970	757	106	651	605	99	506	152	7	145
1971	655	46	609	565	41	524	90	5	85
1972	1,051	42	1,009	916	39	877	135	3	132
1973	1,953	132	1,825	1,675	124	1,550	283	8	275
1974	2,283	266	2,017	1,959	243	1,716	324	23	301
1975	1,198	282	916	1,027	247	780	171	35	136
1976	1,793	131	1,662	1,594	117	1,477	199	14	185
1977	2,329	127	2,202	2,095	114	1,981	234	13	221
1978	3,559	184	3,375	3,203	160	3,043	356	24	332
1979	4,873	378	4,495	4,202	336	3,866	671	42	629
1980	4,436	551	3,885	3,986	490	3,496	450	61	389
1981	2,799	571	2,228	2,476	530	1,946	323	41	282

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL FORMING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

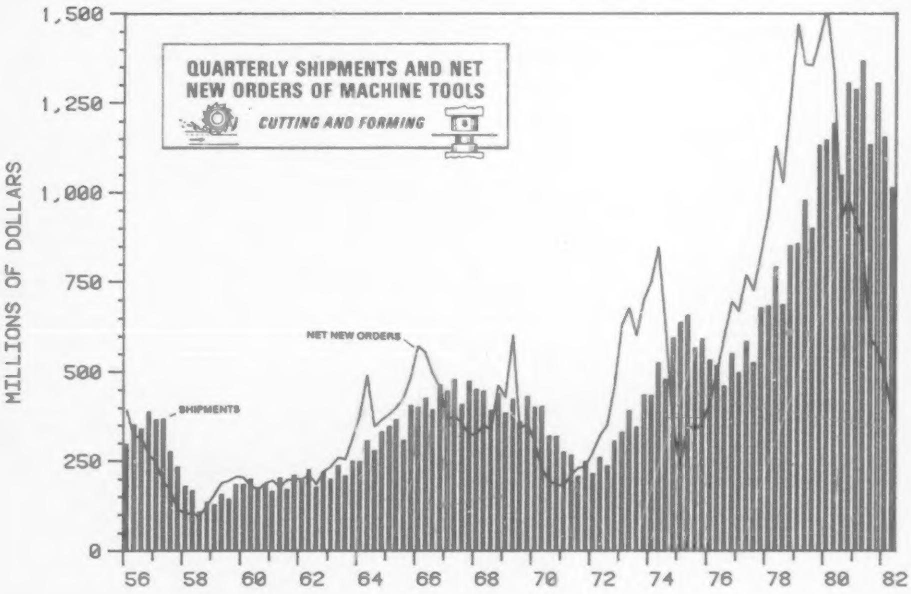
	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders
1956	$ 340	$ 25	$ 315	$ 314	$ 24	$ 290	$ 26	$ 1	$ 25
1957	181	11	170	164	11	153	17	0	17
1958	134	6	128	108	5	103	26	1	25
1959	210	3	207	175	2	173	35	1	34
1960	219	10	209	161	9	152	58	1	57
1961	187	6	181	139	4	135	48	2	46
1962	249	5	244	197	4	193	52	1	51
1963	309	8	301	269	7	262	40	1	39
1964	568	29	539	511	24	487	57	5	52
1965	459	18	441	427	17	410	32	1	31
1966	480	35	445	434	33	401	46	2	44
1967	322	36	286	281	33	248	41	3	38
1968	415	21	394	380	20	360	35	1	34
1969	578	45	533	527	43	484	51	2	49
1970	303	42	261	265	38	227	38	4	34
1971	278	25	252	244	21	223	34	4	29
1972	414	11	403	378	10	368	36	1	35
1973	815	28	787	742	25	717	73	3	70
1974(r)	687	121	566	583	113	470	105	8	96
1975(r)	453	92	361	364	81	284	89	12	77
1976(r)	578	37	541	513	28	485	64	8	56
1977(r)	824	31	793	757	29	729	67	2	64
1978(r)	1,013	40	973	938	37	901	75	3	72
1979(r)	1,190	64	1,126	1,048	57	991	142	7	136
1980(r)	946	76	870	814	70	744	132	6	126
1981	786	69	717	680	63	617	106	6	100

r - Revised; Metal Forming Net New Order data for 1974-80 was revised by NMTBA in 1981.

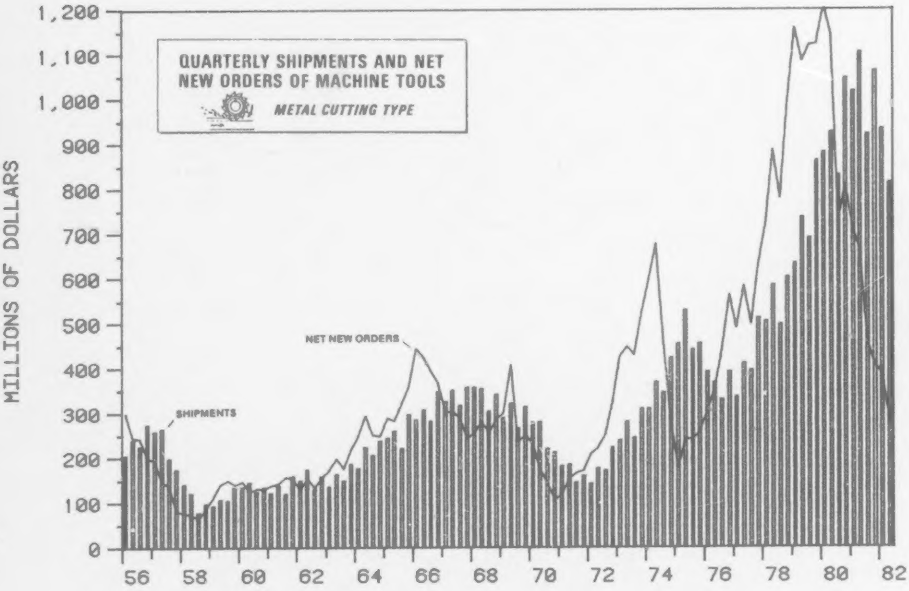
Individual columns may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

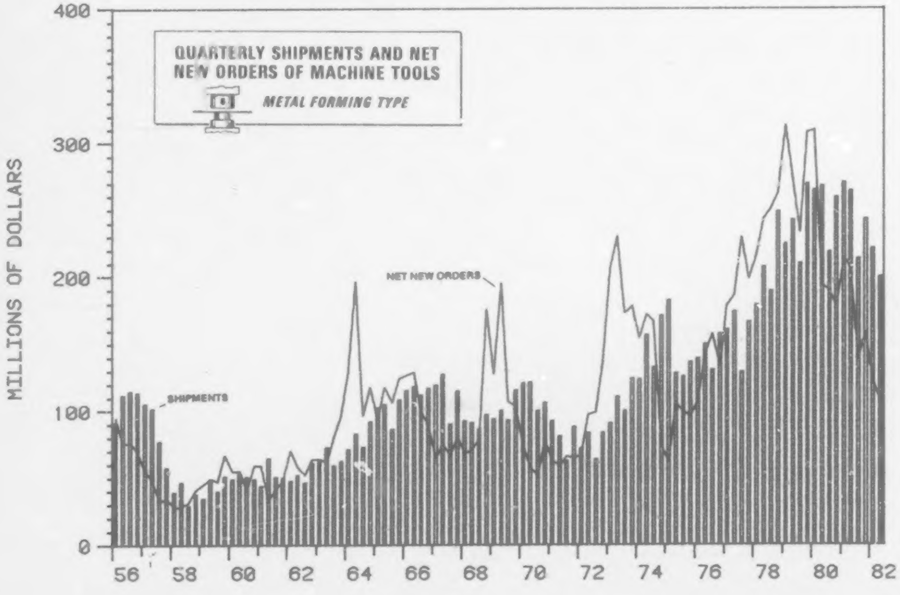
MACHINE TOOL INDUSTRY
SHIPMENTS (BAR) AND NET NEW ORDERS (LINE)



METAL CUTTING MACHINE TOOL
SHIPMENTS (BAR) AND NET NEW ORDERS (LINE)



METAL FORMING MACHINE TOOL
SHIPMENTS (BAR) AND NET NEW ORDERS (LINE)



SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1956-1962
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956—1 qtr.	$ 274,100	$ 23,750	$ 187,700	$ 18,550	$ 86,400	$ 5,200
2	326,100	25,600	218,700	21,150	107,400	4,450
3	319,200	21,100	208,100	17,350	111,100	3,750
4	350,900	36,550	243,700	29,950	107,200	6,600
Total	$ 1,270,300	$ 107,000	$ 858,200	$ 87,000	$ 412,100	$ 20,000
1957—1 qtr.	$ 331,900	$ 33,350	$ 232,950	$ 26,650	$ 98,950	$ 6,700
2	325,700	41,900	236,150	29,650	89,550	12,250
3	248,050	28,350	179,300	19,800	68,750	8,550
4	204,700	28,750	155,150	20,500	49,550	8,250
Total	$ 1,110,350	$ 132,350	$ 803,550	$ 96,600	$ 306,800	$ 35,750
1958—1 qtr.	$ 160,050	$ 19,900	$ 125,500	$ 15,400	$ 34,550	$ 4,500
2	141,800	25,700	105,050	15,750	36,750	9,950
3	90,300	17,450	65,400	13,050	24,900	4,400
4	115,000	21,000	85,150	13,100	29,850	7,900
Total	$ 507,150	$ 84,050	$ 381,100	$ 57,300	$ 126,050	$ 26,750
1959—1 qtr.	$ 108,200	$ 20,750	$ 79,300	$ 14,900	$ 28,900	$ 5,850
2	137,450	19,550	95,450	12,050	42,000	7,500
3	130,650	14,400	95,050	10,000	35,600	4,400
4	162,000	23,000	120,050	13,800	41,950	9,200
Total	$ 538,300	$ 77,700	$ 389,850	$ 50,750	$ 148,450	$ 26,950
1960—1 qtr.	$ 159,550	$ 25,950	$ 117,700	$ 18,700	$ 41,850	$ 7,250
2	160,400	38,500	116,950	28,750	43,450	9,750
3	136,950	38,650	96,350	28,450	40,600	10,200
4	123,950	60,050	89,750	44,850	34,200	15,200
Total	$ 580,850	$ 163,150	$ 420,750	$ 120,750	$ 160,100	$ 42,400
1961—1 qtr.	$ 116,150	$ 50,100	$ 83,650	$ 38,550	$ 32,500	$ 11,550
2	146,450	56,650	95,900	42,550	50,550	14,100
3	117,200	53,750	80,250	39,800	36,950	13,950
4	142,850	67,750	106,750	53,800	36,100	13,950
Total	$ 522,650	$ 228,250	$ 366,550	$ 174,700	$ 156,100	$ 53,550
1962—1 qtr.	$ 140,250	$ 57,700	$ 106,100	$ 43,900	$ 34,150	$ 13,800
2	159,750	66,950	121,150	53,050	38,600	13,900
3	136,200	41,250	98,400	32,400	37,800	8,850
4	169,850	49,300	124,400	33,450	45,450	15,850
Total	$ 606,050	$ 215,200	$ 450,050	$ 162,800	$ 156,000	$ 52,400

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1963-1969
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1963—1 qtr.	$ 163,100	$ 36,850	$ 112,600	$ 24,650	$ 50,500	$ 12,200
2	203,300	33,500	140,550	23,600	62,750	9,900
3	173,000	36,150	122,450	27,450	50,550	8,700
4	201,850	48,000	150,450	36,700	51,400	11,300
Total	$ 741,250	$ 154,500	$ 526,050	$ 112,400	$ 215,200	$ 42,100
1964—1 qtr.	$ 197,250	$ 50,700	$ 135,900	$ 40,550	$ 61,350	$ 10,150
2	259,800	46,700	183,550	39,850	76,250	6,850
3	231,200	47,950	170,400	35,700	60,800	12,250
4	271,500	59,250	189,300	49,400	82,200	9,850
Total	$ 959,750	$ 204,600	$ 679,150	$ 165,500	$ 280,600	$ 39,100
1965—1 qtr.	$ 304,100	$ 42,600	$ 209,850	$ 34,150	$ 94,250	$ 8,450
2	319,850	45,700	225,200	35,100	94,650	10,600
3	271,300	36,700	193,700	27,850	77,600	8,850
4	353,550	51,800	257,100	39,600	96,450	12,200
Total	$ 1,248,800	$ 176,800	$ 885,850	$ 136,700	$ 362,950	$ 40,100
1966—1 qtr.	$ 361,650	$ 39,000	$ 253,900	$ 31,350	$ 107,750	$ 7,650
2	389,700	36,150	277,200	30,150	112,500	6,000
3	361,950	32,300	256,800	25,150	105,150	7,150
4	421,050	43,400	309,600	37,600	111,450	5,800
Total	$ 1,534,350	$ 150,850	$ 1,097,500	$ 124,250	$ 436,850	$ 26,600
1967—1 qtr.	$ 399,500	$ 41,050	$ 289,750	$ 35,900	$ 109,750	$ 10,000
2	428,850	50,750	315,450	36,250	113,400	14,050
3	367,350	45,900	287,200	30,800	80,150	10,250
4	422,250	50,300	318,650	39,200	103,600	11,550
Total	$ 1,617,950	$ 188,000	$ 1,211,050	$ 142,150	$ 406,900	$ 45,850
1968—1 qtr.	$ 402,200	$ 48,250	$ 321,500	$ 36,000	$ 80,700	$ 12,250
2	392,800	53,550	313,850	40,950	78,950	12,600
3	361,750	29,550	282,900	21,650	78,850	7,900
4	406,000	32,800	320,050	21,400	85,950	11,400
Total	$ 1,562,750	$ 164,150	$ 1,238,300	$ 120,000	$ 324,450	$ 44,150
1969—1 qtr.	$ 353,500	$ 30,600	$ 268,100	$ 21,350	$ 85,400	$ 9,250
2	384,300	38,450	293,250	28,500	91,050	9,950
3	321,950	37,800	234,850	31,450	87,100	6,350
4	387,000	43,950	281,250	33,700	105,750	10,250
Total	$ 1,446,750	$ 150,800	$ 1,077,450	$ 115,000	$ 369,300	$ 35,800

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1970-1976
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1970—1 qtr.	$ 351,950	$ 48,700	$ 241,500	$ 37,900	$ 110,450	$ 10,800
2	348,000	54,800	236,200	44,550	111,800	10,250
3	269,350	51,600	176,050	44,350	93,300	7,250
4	269,650	49,000	173,600	38,750	96,050	10,250
Total	$ 1,238,950	$ 204,100	$ 827,350	$ 165,550	$ 411,600	$ 38,550
1971—1 qtr.	$ 228,500	$ 46,300	$ 142,900	$ 39,000	$ 85,600	$ 7,300
2	228,350	37,900	154,200	30,850	74,150	7,050
3	173,000	35,100	120,300	24,800	52,700	10,300
4	209[illegible]	38,800	136,800	23,450	73,150	15,350
Total	$ 839[illegible]	$ 158,100	$ 554,200	$ 118,100	$ 285,600	$ 40,000
1972—1 qtr.	$ 183,750	$ 31,550	$ 121,900	$ 20,850	$ 61,850	$ 10,700
2	229,550	31,050	155,650	21,100	73,900	9,950
3	209,300	27,050	151,300	21,200	58,000	5,850
4	271,750	34,700	198,300	24,150	73,450	10,550
Total	$ 894,350	$ 124,350	$ 627,150	$ 87,300	$ 267,200	$ 37,050
1973—1 qtr.	$ 295,050	$ 35,500	$ 209,950	$ 29,400	$ 85,100	$ 6,100
2	347,500	43,200	243,750	36,050	103,750	7,150
3	296,650	48,950	207,450	37,850	89,200	11,100
4	383,900	50,250	273,900	35,400	110,000	14,850
Total	$ 1,323,100	$ 177,900	$ 935,050	$ 138,700	$ 388,050	$ 39,200
1974—1 qtr.	$ 378,550	$ 54,750	$ 269,850	$ 39,400	$ 108,700	$ 15,350
2	464,250	61,350	323,800	44,850	140,450	16,500
3	408,800	69,350	291,000	54,700	117,800	14,650
4	511,550	81,950	356,700	65,550	154,850	16,400
Total	$ 1,763,150	$ 267,400	$ 1,241,350	$ 204,500	$ 521,800	$ 62,900
1975—1 qtr.	$ 526,550	$ 109,700	$ 375,400	$ 78,400	$ 151,150	$ 31,300
2	554,750	101,400	443,450	84,550	111,300	16,850
3	467,150	99,650	361,850	79,050	105,300	20,600
4	484,150	108,350	367,400	88,550	116,750	19,800
Total	$ 2,032,600	$ 419,100	$ 1,548,100	$ 330,550	$ 484,500	$ 88,550
1976—1 qtr.	$ 446,550	$ 85,300	$ 334,150	$ 58,500	$ 112,400	$ 26,800
2	425,400	92,450	302,100	65,750	123,300	26,700
3	393,450	66,900	284,850	45,100	108,600	21,800
4	477,950	71,650	348,750	42,900	129,200	28,750
Total	$ 1,743,350	$ 316,300	$ 1,269,850	$ 212,250	$ 473,500	$ 104,050

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1977 to Date
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1977—1 qtr.	$ 433,800	$ 63,100	$ 297,550	$ 38,550	$ 136,250	$ 24,550
2	526,300	58,400	365,650	45,150	160,650	13,250
3	476,000	48,050	359,300	35,850	116,700	12,200
4	594,100	81,000	447,350	61,400	146,750	19,600
Total	$ 2,030,200	$ 250,550	$ 1,469,850	$ 180,950	$ 560,350	$ 69,600
1978—1 qtr.	$ 620,900	$ 62,300	$ 459,650	$ 44,200	$ 161,250	$ 18,100
2	712,550	79,050	526,950	57,250	185,600	21,800
3	609,800	77,750	438,850	59,200	170,950	18,550
4	745,350	105,750	534,650	67,750	210,700	38,000
Total	$ 2,688,600	$ 324,850	$ 1,960,100	$ 228,400	$ 728,500	$ 96,450
1979—1 qtr.	$ 769,750	$ 88,300	$ 564,450	$ 69,000	$ 205,300	$ 19,300
2	869,050	109,150	648,100	87,650	220,950	21,500
3	802,800	97,050	611,350	78,500	191,450	18,550
4	1,023,700	116,750	781,600	89,400	242,100	27,350
Total	$ 3,465,300	$ 411,250	$ 2,605,500	$ 324,550	$ 859,800	$ 86,700
1980—1 qtr.	$ 1,030,450	$ 115,700	$ 794,650	$ 86,750	$ 235,800	$ 28,950
2	1,037,750	155,550	802,500	122,850	235,250	32,700
3	915,200	133,850	727,800	102,650	187,400	31,200
4	1,100,850	202,400	881,050	162,550	219,800	39,850
Total	$ 4,084,250	$ 607,500	$ 3,206,000	$ 474,800	$ 878,250	$ 132,700
1981—1 qtr.	$ 1,077,400	$ 210,800	$ 862,250	$ 155,600	$ 215,150	$ 55,200
2	1,131,150	236,350	917,950	185,450	213,200	50,900
3	1,006,000	127,950	820,350	99,950	185,650	28,000
4	1,162,100	143,850	951,900	111,050	210,200	32,800
Total	$ 4,376,650	$ 718,950	$ 3,552,450	$ 552,050	$ 824,200	$ 166,900

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipment and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1956-1962

(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956—1 qtr.	$ 353,700	$ 39,050	$ 265,200	$ 33,200	$ 88,500	$ 5,850
2	291,700	26,300	222,550	20,300	69,150	6,000
3	284,150	34,800	215,400	27,150	68,750	7,650
4	242,700	26,450	179,050	20,650	63,650	5,800
Total	$ 1,172,250	$ 126,600	$ 882,200	$ 101,300	$ 290,050	$ 25,300
1957—1 qtr.	$ 221,300	$ 25,500	$ 168,850	$ 22,950	$ 52,450	$ 2,550
2	176,600	16,300	131,650	12,900	44,950	3,400
3	152,450	17,300	123,450	13,700	29,000	3,600
4	95,150	19,150	68,000	11,650	27,150	7,500
Total	$ 645,500	$ 78,250	$ 491,950	$ 61,200	$ 153,550	$ 17,050
1958—1 qtr.	$ 86,000	$ 17,600	$ 61,750	$ 14,400	$ 24,250	$ 3,200
2	78,300	22,650	57,050	15,150	21,250	7,500
3	79,800	15,950	55,450	8,700	24,350	7,250
4	107,200	21,250	73,700	13,300	33,500	7,950
Total	$ 351,300	$ 77,450	$ 247,950	$ 51,550	$ 103,350	$ 25,900
1959—1 qtr.	$ 139,100	$ 18,300	$ 97,900	$ 14,150	$ 41,200	$ 4,150
2	172,700	16,800	127,550	12,800	45,150	4,000
3	168,300	28,500	132,350	17,450	35,950	11,050
4	164,350	42,200	113,150	26,450	51,200	15,750
Total	$ 644,450	$ 105,800	$ 470,950	$ 70,850	$ 173,500	$ 34,950
1960—1 qtr.	$ 158,500	$ 44,750	$ 112,850	$ 35,700	$ 45,650	$ 9,050
2	124,250	55,900	85,600	39,100	38,650	16,800
3	114,950	56,550	90,200	41,150	24,750	15,400
4	129,950	60,100	86,350	44,350	43,600	15,750
Total	$ 527,650	$ 217,300	$ 375,000	$ 160,300	$ 152,650	$ 57,000
1961—1 qtr.	$ 140,550	$ 57,000	$ 95,150	$ 43,250	$ 45,400	$ 13,750
2	124,150	53,000	100,050	43,750	24,100	9,250
3	128,100	70,250	97,450	59,050	30,650	11,200
4	143,950	57,550	108,500	44,600	35,450	12,950
Total	$ 536,750	$ 237,800	$ 401,150	$ 190,650	$ 135,600	$ 47,150
1962—1 qtr.	$ 156,600	$ 42,300	$ 102,200	$ 26,200	$ 54,400	$ 16,100
2	167,400	45,300	123,850	30,850	43,550	14,450
3	147,950	36,400	108,850	23,550	39,100	12,850
4	190,100	30,550	133,950	22,650	56,150	7,900
Total	$ 662,050	$ 154,550	$ 468,850	$ 103,250	$ 193,200	$ 51,300

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1963-1969
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1963—1 qtr.	$ 196,150	$ 39,000	$ 140,250	$ 31,100	$ 55,900	$ 7,900
2	197,300	62,150	148,300	49,450	49,000	12,700
3	208,750	45,700	140,350	33,850	68,400	11,850
4	267,450	45,100	177,950	38,500	89,500	6,600
Total	$ 869,650	$ 191,950	$ 606,850	$ 152,900	$ 262,800	$ 39,050
1964—1 qtr.	$ 312,150	$ 64,000	$ 194,200	$ 52,900	$ 117,950	$ 11,100
2	428,100	63,200	248,150	46,300	179,950	16,900
3	293,750	52,850	209,900	40,700	83,850	12,150
4	314,050	50,800	209,000	38,000	105,050	12,800
Total	$ 1,348,050	$ 230,850	$ 861,250	$ 177,900	$ 486,800	$ 52,950
1965—1 qtr.	$ 338,850	$ 43,150	$ 253,000	$ 35,500	$ 85,850	$ 7,650
2	365,650	33,400	255,400	26,050	110,250	7,350
3	385,050	42,800	284,500	37,250	100,550	5,550
4	443,400	41,100	329,750	30,250	113,650	10,850
Total	$ 1,532,950	$ 160,450	$ 1,122,650	$ 129,050	$ 410,300	$ 31,400
1966—1 qtr.	$ 514,200	$ 57,450	$ 398,150	$ 46,450	$ 116,050	$ 11,000
2	497,800	54,350	384,400	38,500	113,400	15,850
3	457,650	38,100	364,950	30,550	92,700	7,550
4	414,800	41,300	335,600	31,300	79,200	10,000
Total	$ 1,884,450	$ 191,200	$ 1,483,100	$ 146,800	$ 401,350	$ 44,400
1967—1 qtr.	$ 327,800	$ 37,150	$ 268,600	$ 32,350	$ 59,200	$ 4,900
2	335,600	42,500	273,550	29,100	62,050	13,400
3	319,200	35,350	262,950	25,350	56,250	10,000
4	290,200	33,800	219,550	23,500	70,650	10,300
Total	$ 1,272,800	$ 148,800	$ 1,024,650	$ 110,300	$ 248,150	$ 38,500
1968—1 qtr.	$ 287,050	$ 36,800	$ 223,700	$ 31,750	$ 63,350	$ 5,050
2	307,300	44,850	246,400	34,750	60,900	10,100
3	303,800	31,900	232,200	24,250	71,600	7,650
4	422,300	40,100	257,600	28,700	164,700	11,400
Total	$ 1,320,450	$ 153,650	$ 959,900	$ 119,450	$ 360,550	$ 34,200
1969—1 qtr.	$ 376,550	$ 51,450	$ 260,000	$ 40,250	$ 116,550	$ 11,200
2	557,850	46,000	372,550	35,700	185,300	10,300
3	279,300	63,700	184,950	51,100	94,350	12,600
4	303,300	50,600	215,150	35,600	88,150	15,000
Total	$ 1,517,000	$ 211,750	$ 1,032,650	$ 162,650	$ 484,350	$ 49,100

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1970-1976
(Thousands of Dollars)

	TOTAL (r)		Metal Cutting		Metal Forming (r)	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1970—1 qtr.	$ 256,650	$ 48,750	$ 191,300	$ 39,750	$ 65,350	$ 9,000
2	185,550	46,100	131,950	41,850	53,600	4,250
3	150,400	41,750	106,900	34,150	43,500	7,600
4	140,750	42,600	76,600	28,800	64,150	13,800
Total	$ 733,350	$ 179,200	$ 506,750	$ 144,550	$ 226,600	$ 34,650
1971—1 qtr.	$ 151,000	$ 30,550	$ 95,500	$ 23,250	$ 55,500	$ 7,300
2	182,250	30,150	128,800	24,550	53,450	5,600
3	204,100	27,450	144,500	20,900	59,600	6,550
4	209,950	25,700	155,300	15,950	54,650	9,750
Total	$ 747,300	$ 113,850	$ 524,100	$ 84,650	$ 223,200	$ 29,200
1972—1 qtr.	$ 242,050	$ 33,550	$ 180,550	$ 27,100	$ 61,500	$ 6,450
2	284,750	34,900	193,800	28,350	90,950	6,550
3	301,550	51,550	210,900	42,800	90,650	8,750
4	417,100	46,550	292,000	33,450	125,100	13,100
Total	$ 1,245,450	$ 166,550	$ 877,250	$ 131,700	$ 368,200	$ 34,850
1973—1 qtr.	$ 558,150	$ 73,850	$ 370,150	$ 55,850	$ 188,000	$ 18,000
2	610,550	67,550	395,450	52,550	215,100	15,000
3	512,850	87,250	358,450	68,900	154,400	18,350
4	586,050	116,400	426,350	97,750	159,700	18,650
Total	$ 2,267,600	$ 345,050	$ 1,550,400	$ 275,050	$ 717,200	$ 70,000
1974—1 qtr.	$ 644,500	$ 107,700	$ 509,750	$ 88,100	$ 134,750	$ 19,600
2	737,950	109,900	592,550	83,650	145,400	26,250
3	536,300	95,200	394,100	70,900	142,200	24,300
4	266,500	85,000	219,250	58,750	47,250	26,250
Total	$ 2,185,250	$ 397,800	$ 1,715,650	$ 301,400	$ 469,600	$ 96,400
1975—1 qtr.	$ 188,350	$ 49,250	$ 147,700	$ 28,550	$ 40,650	$ 20,700
2	276,800	68,950	201,050	39,800	75,750	29,150
3	293,750	46,700	209,600	31,750	84,150	14,950
4	305,150	47,800	222,150	35,300	83,000	12,500
Total	$ 1,064,050	$ 212,700	$ 780,500	$ 135,400	$ 283,550	$ 77,300
1976—1 qtr.	$ 354,500	$ 58,800	$ 259,950	$ 45,800	$ 94,550	$ 13,000
2	452,700	43,900	322,700	31,350	130,000	12,550
3	527,800	69,500	383,500	55,900	144,300	13,600
4	626,450	69,550	510,450	52,500	116,000	17,050
Total	$ 1,961,450	$ 241,750	$ 1,476,600	$ 185,550	$ 484,850	$ 56,200

r - Revised; Metal Forming Net New Order data for 1974-80 was revised by NMTBA in 1981.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS

Quarterly and Yearly, 1977 to Date

(Thousands of Dollars)

Period	TOTAL (r)		Metal Cutting		Metal Forming (r)	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1977—1 qtr.	$ 603,900	$ 63,550	$ 443,850	$ 45,150	$ 160,050	$ 18,400
2	692,250	78,300	522,600	61,100	169,650	17,200
3	650,700	75,150	435,300	60,900	215,400	14,250
4	762,800	68,700	578,950	54,200	183,850	14,500
Total	$ 2,709,650	$ 285,700	$ 1,980,700	$ 221,350	$ 728,950	$ 64,350
1978—1 qtr.	$ 847,300	$ 92,750	$ 646,250	$ 77,600	$ 201,050	$ 15,150
2	1,013,250	116,700	789,550	97,000	223,700	19,700
3	953,850	73,800	720,700	56,250	233,150	17,550
4	1,129,700	121,150	886,650	101,450	243,050	19,700
Total	$ 3,944,100	$ 404,400	$ 3,043,150	$ 332,300	$ 900,950	$ 72,100
1979—1 qtr.	$ 1,322,800	$ 148,600	$ 1,031,550	$ 126,700	$ 291,250	$ 21,900
2	1,189,000	167,450	963,300	120,250	225,700	47,200
3	1,171,850	181,350	969,400	151,100	202,450	30,250
4	1,172,850	267,550	901,550	231,250	271,300	36,300
Total	$ 4,856,500	$ 764,950	$ 3,865,800	$ 629,300	$ 990,700	$ 135,650
1980—1 qtr.	$ 1,331,950	$ 185,500	$ 1,057,900	$ 149,900	$ 274,050	$ 35,600
2	1,210,050	125,300	1,054,300	87,800	155,750	37,500
3	825,350	92,150	659,050	69,250	166,300	22,900
4	872,200	111,800	724,250	82,300	147,950	29,500
Total	$ 4,239,550	$ 514,750	$ 3,495,500	$ 389,250	$ 744,050	$ 125,500
1981—1 qtr.	$ 809,950	$ 110,400	$ 615,250	$ 91,350	$ 194,700	$ 19,050
2	723,600	143,400	559,950	101,250	163,650	42,150
3	530,650	62,800	408,100	47,150	122,550	15,650
4	498,450	65,600	362,500	42,550	135,950	23,050
Total	$ 2,562,650	$ 382,200	$ 1,945,800	$ 282,300	$ 616,850	$ 99,900

r - Revised; Metal Forming Net New Order data for 1974-80 was revised by NMTBA in 1981.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOL PRODUCTS
By Type of Machine, 1972 to Date
(Millions of Dollars)

	1972	1973	1974	1975	1976	1977	1978	1979
MACHINE TOOLS TOTAL	$1,928.6	$2,595.6	$3,189.4	$3,431.8	$3,197.4	$3,675.2	$4,735.0	$5,762.3
METAL CUTTING TOTAL	1,258.5	1,718.6	2,136.1	2,405.7	2,146.4	2,560.5	3,377.1	4,127.5
Boring Machines	58.7	71.8	85.3	90.6	80.2	93.5	133.0	169.9
Drilling Machines	73.7	100.5	81.1	97.9	(99.0)	108.9	(155.0)	167.1
Gear Cutting & Finishing Machines	56.7	62.3	70.2	71.7	61.9	67.1	111.5	104.6
Grinding & Polishing Machines (a)	168.6	237.2	269.8	276.2	243.5	288.3	359.5	464.5
Lathes	197.6	292.4	396.1	474.0	449.8	455.9	554.9	675.7
Milling Machines	86.6	112.1	143.3	141.9	146.8	167.8	204.8	259.3
Other Machine Tools (b)	303.1	460.4	631.1	802.3	629.8	713.6	994.8	1,279.3
Parts (c)	242.1	308.5	396.5	382.8	400.7	502.1	606.0	813.7
Not Specified by Kind	71.4	73.4	(62.7)	(68.4)	(34.7)	163.3	(s)	(193.3)
METAL FORMING TOTAL	670.1	877.0	1,053.3	1,026.1	1,051.0	1,114.7	1,357.9	1,634.8
Punching, Shearing, Bending & Forming	153.4	165.2	211.4	242.3	271.3	280.1	320.4	389.9
Presses (d)	183.2	258.5	327.2	282.8	268.1	282.6	369.1	449.5
Other (b)	149.0	197.8	192.4	162.3	157.0	171.7	220.3	264.4
Parts (c)	161.5	212.7	304.0	322.8	344.3	295.5	400.5	482.5
Not Specified by Kind	23.0	22.8	(18.3)	(15.9)	(10.2)	84.8	(s)	48.5

(a) Excluding Gear-Tooth Grinding, Honing, Lapping, Polishing and Buffing Machines.
(b) Including those designed primarily for Home Workshops, Laboratories, etc.
(c) Parts sold separately and rebuilt machine tools.
(d) Including Forging Presses.
(s) Withheld because estimate did not meet publication standards.
( ) Indicates standard errors exceeding 15%.

This table includes machine tool products only—those produced as "primary" products of the machine tool industry and as "secondary" products by other industries.

Sources: U.S. Bureau of the Census; "Census of Manufactures, Metal Working Machinery and Equipment" and "Annual Survey of Manufactures".

SHIPMENTS OF MACHINE TOOLS

Metal Cutting and Metal Forming, Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

Year	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
	Units	Value	Units	Value	Units	Value
1958	NA	$ 671,907	NA	NA	NA	NA
1959	196,701	679,538	65,892	$ 648,368	130,809	$ 31,170
1960	183,142	777,692	62,225	749,900	120,917	27,792
1961	170,982	764,453	57,503	737,051	113,479	27,402
1962	190,288	867,269	67,678	837,370	122,610	29,899
1963	198,571	967,133	73,255	934,485	125,316	32,648
1964	212,257	1,209,076	81,020	1,176,645	131,237	32,431
1965	250,492	1,457,685	93,350	1,418,294	157,142	39,391
1966	321,705	1,712,849	112,654	1,658,651	209,051	54,198
1967	311,472	1,869,298	117,651	1,820,197	193,821	49,101
1968	301,114	1,722,727	95,927	1,668,852	205,187	53,875
1969	308,273	1,692,188	92,148	1,631,239	216,125	60,949
1970	252,431	1,551,777	73,517	1,501,454	178,914	50,323
1971	211,432	1,057,870	51,843	1,009,389	159,589	48,481
1972	267,065	1,269,302	71,655	1,220,521	195,410	48,781
1973	307,680	1,787,850	94,833	1,724,719	212,847	63,131
1974	337,799	2,165,937	106,016	2,096,198	231,783	69,739
1975	280,341	2,406,082	92,731	2,353,936	187,610	52,146
1976	270,875	2,178,265	82,937	2,119,846	187,938	58,419
1977	284,583	2,453,423	92,270	2,393,964	192,313	59,459
1978	327,460	3,142,594	87,589	3,050,209	239,871	92,385
1979	345,218	4,064,045	89,586E	3,934,566E	255,632E	129,479E
1980(r)	323,899	4,812,349	88,428E	4,674,068E	235,471E	138,281E
1981(p)	302,513	5,130,948	84,505E	5,013,000E	218,008E	117,948E

p - Preliminary. r - Revised. NA - Not Available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

Data on shipments of complete machine tools published in the "Current Industrial Reports" series of the Census tend to vary slightly from those published by NMTBA. There are several reasons for the difference; among them is the fact that NMTBA reports are extended to a 100 percent estimate based on earlier coverage by the "Current Industrial Reports" series. Refer to this chapter's introduction for a detailed explanation of the various sources of statistics for machine tools.

SHIPMENTS OF METAL CUTTING MACHINE TOOLS
Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 462,934	NA	NA	NA	NA
1959	143,380	468,777	45,212	$ 447,009	98,168	$ 21,768
1960	133,511	539,340	42,914	520,294	90,597	19,046
1961	124,260	531,343	40,363	512,424	83,897	18,919
1962	138,855	626,833	47,942	606,297	90,913	20,536
1963	139,896	657,607	50,353	635,157	89,543	22,450
1964	153,831	874,467	58,714	852,392	95,117	22,075
1965	184,168	1,047,823	68,005	1,021,331	116,163	26,492
1966	242,698	1,231,907	80,673	1,194,149	162,025	37,758
1967	236,167	1,373,178	86,014	1,336,419	150,153	36,759
1968	225,778	1,309,361	70,505	1,271,876	155,273	37,485
1969	229,974	1,242,550	65,199	1,198,504	164,775	44,046
1970	188,491	1,097,718	49,314	1,061,066	139,177	36,652
1971	157,099	714,454	32,443	677,841	124,656	36,613
1972	207,290	857,964	47,846	821,899	159,444	36,065
1973	252,237	1,224,715	63,685	1,175,058	188,552	49,657
1974	272,811	1,525,575	69,060	1,466,671	203,751	58,904
1975	229,169	1,790,360	65,883	1,750,797	163,286	39,563
1976	212,757	1,592,216	54,974	1,546,631	157,783	45,585
1977	220,017	1,791,293	59,500	1,743,724	160,517	47,569
1978	257,647	2,334,425	58,116	2,265,541	199,531	68,884
1979	263,019	3,037,205	59,453E	2,943,225E	203,566E	93,980E
1980(r)	248,563	3,716,370	62,185E	3,612,645E	186,378E	103,725E
1981(p)	234,812	4,051,741	59,933E	3,969,800E	174,879E	81,941E

p - Preliminary. r - Revised. NA - Not available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

Year	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
	Units	Value	Units	Value	Units	Value
1958	NA	$ 203,973	NA	NA	NA	NA
1959	53,321	210,761	20,680	$ 201,359	32,641	$ 9,402
1960	49,631	238,352	19,311	229,606	30,320	8,746
1961	46,722	233,110	17,140	224,627	29,582	8,483
1962	51,433	240,436	19,736	231,073	31,697	9,363
1963	58,675	309,526	22,902	299,328	35,773	10,198
1964	58,426	334,609	22,306	324,253	36,120	10,356
1965	66,324	409,862	25,345	396,963	40,979	12,899
1966	79,007	480,942	31,981	464,502	47,026	16,440
1967	75,305	496,120	31,637	483,778	43,668	12,342
1968	75,336	413,366	25,422	396,976	49,914	16,390
1969	78,299	449,638	26,949	432,735	51,350	16,903
1970	63,940	454,059	24,203	440,388	39,737	13,671
1971	54,333	343,416	19,400	331,548	34,933	11,868
1972	59,775	411,338	24,107	398,622	35,668	12,716
1973	55,443	563,135	31,148	549,661	24,295	13,474
1974	64,988	640,362	36,956	629,527	28,032	10,835
1975	51,172	615,722	26,848	603,139	24,324	12,583
1976	58,118	586,049	27,963	573,215	30,155	12,834
1977	64,566	662,130	32,770	650,240	31,796	11,890
1978	69,813	808,169	29,473	784,668	40,340	23,501
1979	82,199	1,026,840	30,133	991,341	52,066	35,499
1980(r)	75,336	1,095,979	26,243	1,061,423	49,093	34,556
1981(p)	67,701	1,079,207	22,116	1,043,200	45,585	36,007

p - Preliminary. r - Revised. NA - Not Available.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series, MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1954 to Date

(Millions of Dollars)

Year	TOTAL	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting and Finishing	35414 Grinding and Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting Machines
1954	$ 879.0	$114.4	$ 86.1	$ 48.1	$154.3	$206.9	$122.5	$ 146.7
1955	665.8	77.4	53.8	36.6	123.9	153.3	89.6	131.2
1956	891.8	101.8	65.4	49.4	172.8	217.1	115.8	169.5
1957	878.3	102.0	56.3	38.9	160.1	199.8	155.0	166.2
1958	463.0	51.6	30.0	22.7	89.4	98.7	89.3	81.3
1959	468.8	46.2	33.4	24.7	93.8	119.5	73.3	77.9
1960	539.3	46.9	38.9	34.3	117.0	135.4	79.4	87.4
1961	531.3	51.5	36.8	36.4	121.0	126.5	73.7	85.4
1962	626.8	61.4	53.2	35.8	127.9	152.3	95.8	100.4
1963	657.6	67.9	52.0	39.5	136.8	154.8	106.1	100.5
1964	874.5	74.1	72.3	47.1	175.9	198.1	125.8	181.2
1965	1,047.8	91.9	83.2	55.7	213.6	234.8	144.0	224.7
1966	1,231.9	110.9	105.9	59.0	235.9	286.5	201.7	232.0
1967	1,373.2	117.8	122.8	63.9	247.8	334.0	234.3	252.6
1968	1,309.4	93.7	67.7	68.2	235.1	316.2	234.1	294.4
1969	1,242.6	80.2	67.5	65.6	227.3	288.9	184.6	328.5
1970	1,097.7	62.1	70.9	66.3	219.4	240.1	110.0	329.0
1971	714.5	35.8	43.4	50.1	142.9	174.9	54.4	212.7
1972	858.0	54.1	65.8	50.3	151.0	203.2	81.7	251.9
1973	1,224.7	66.7	90.5	55.4	209.6	299.0	104.6	398.9
1974	1,525.6	81.4	77.9	66.2	249.9	370.2	137.7	542.3
1975	1,790.4	83.9	92.9	65.1	273.2	464.2	134.0	677.1
1976	1,592.2	77.8	100.4	56.0	246.8	430.3	134.4	546.6
1977	1,791.3	84.9	107.2	61.4	273.1	436.3	160.2	668.1
1978	2,334.4	117.7	152.4	102.7	348.6	535.9	194.3	882.9
1979(r)	3,037.2	177.4	150.5	111.2	474.9	650.3	279.8	1,193.1
1980(r)	3,716.4	192.0	186.9	130.3	555.8	827.0	339.3	1,485.3
1981(p)	4,051.7	231.6	139.9	133.1	614.2	816.8	436.6	1,679.5

p - Preliminary. r - Revised.

Note: Other Metal Cutting Machines include machining centers, transfer machines, shapers, sawing and cutoff machines, and other metal cutting machines not classified elsewhere. For a breakdown by type, refer to pages detailing shipments of these machines also appearing in this chapter.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1954 to Date

(Percentage of Dollar Value)

Year	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting & Finishing	35414 Grinding & Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting
1954	13.0%	9.8%	5.5%	17.6%	23.5%	13.9%	16.7%
1955	11.6	8.1	5.5	18.6	23.0	13.5	19.7
1956	11.4	7.3	5.5	19.4	24.3	13.0	19.0
1957	11.6	8.4	4.4	18.2	22.7	17.6	18.9
1958	11.1	6.5	4.9	19.3	21.3	19.3	17.6
1959	9.9	7.1	5.3	20.0	25.5	15.6	16.6
1960	8.7	7.2	6.4	21.7	25.1	14.7	16.2
1961	9.7	6.9	6.9	22.8	23.8	13.9	16.1
1962	9.8	8.5	5.7	20.4	24.3	15.3	16.0
1963	10.3	7.9	6.0	20.8	23.5	16.1	15.3
1964	8.5	8.3	5.4	20.1	22.7	14.4	20.7
1965	8.8	7.9	5.3	20.4	22.4	13.7	21.4
1966	9.0	8.6	4.8	19.1	23.3	16.4	18.8
1967	8.6	8.9	4.7	18.0	24.3	17.1	18.4
1968	7.2	5.2	5.2	18.0	24.1	17.9	22.5
1969	6.5	5.4	5.3	18.3	23.2	14.9	26.4
1970	5.7	6.5	6.0	20.0	21.9	10.0	30.0
1971	5.0	6.1	7.0	20.0	24.5	7.6	29.8
1972	6.3	7.7	5.9	17.6	23.7	9.5	29.4
1973	5.4	7.4	4.5	17.1	24.4	8.5	32.6
1974	5.3	5.1	4.3	16.4	24.3	9.0	35.6
1975	4.7	5.2	3.6	15.3	25.9	7.5	37.8
1976	4.9	6.3	3.5	15.5	27.0	8.4	34.3
1977	4.7	6.0	3.4	15.2	24.4	8.9	37.3
1978	5.0	6.5	4.4	14.9	23.0	8.3	37.9
1979	5.8	5.0	3.7	15.6	21.4	9.2	39.3
1980(r)	5.2	5.0	3.5	15.0	22.3	9.1	40.0
1981(p)	5.7	3.5	3.3	15.2	20.2	10.8	41.5

p - Preliminary. r - Revised.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Report, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
By Type of Machine, 1954 to Date
(Millions of Dollars)

Year	TOTAL (a)	35422 Presses, Including Forging	35423 (In Part) Forging, Machines, Excluding Presses	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35485 (In Part) Other (a)
1954	$ 350.2	$216.4	$24.4	$ 26.3	$ 35.6	$ 47.5
1955	295.4	170.8	15.6	28.9	35.8	44.3
1956	384.1	240.1	15.5	34.9	48.8	44.8
1957	403.2	238.7	24.7	38.3	43.9	57.6
1958	209.0	76.5	17.4	32.0	32.1	51.0
1959	210.8	84.6	17.9	29.9	35.7	42.7
1960	238.4	105.0	21.0	32.9	34.3	45.2
1961	233.1	111.3	15.8	33.3	32.5	40.2
1962	240.4	109.5	23.7	34.5	29.0	43.7
1963	309.5	136.0	22.3	42.8	45.2	63.2
1964	334.6	169.5	23.1	33.2	42.7	66.1
1965	409.9	209.2	32.8	43.9	49.4	74.6
1966	480.9	253.3	32.7	49.7	51.0	94.2
1967	496.1	240.1	29.6	56.9	57.4	112.1
1968	413.4	199.1	31.9	57.1	64.4	60.9
1969	449.6	223.7	32.0	53.6	66.0	74.3
1970	454.1	239.6	36.6	47.7	59.8	70.4
1971	343.4	166.5	37.0	41.4	53.3	45.2
1972	411.3	166.7	34.5	62.5	67.9	79.8
1973	563.1	242.7	38.7	75.8	94.5	111.4
1974	640.4	307.0	40.1	86.1	113.0	94.2
1975	615.7	269.4	39.5	121.0	115.4	70.4
1976	586.0	223.6	52.2	120.0	118.8	71.4
1977	662.1	260.7	55.1	130.6	137.2	78.5
1978	808.2	350.9	59.3	146.6	147.7	103.7
1979	1,026.8	434.0(b)	84.7(c)	181.2	183.4	143.5
1980(r)	1,096.0	440.8(b)	73.8(c)	204.2	214.9	162.3
1981(p)	1,079.2	447.5(b)	76.0(c)	208.2	212.1	135.5

p - Preliminary. r - Revised.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses.

(c) Includes forging presses.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
By Type of Machine, 1954 to Date
(Percentage of Dollar Value)

Year	35422 Presses, Including Forging	35423 (In Part) Forging Machines Excluding Presses	35421 (In Part) Punching & Shearing Machines	35421 (In Part) Bending & Forming Machines	35423 (In Part) 35435 (In Part) Other (a)
1954	61.8%	7.0%	7.5%	10.2%	13.5%
1955	57.8	5.3	9.8	12.1	15.0
1956	62.5	4.0	9.1	12.7	11.7
1957	59.2	6.1	9.5	10.9	14.3
1958	36.6	8.3	15.3	15.4	24.4
1959	40.1	8.5	14.2	16.9	20.3
1960	44.0	8.8	13.8	14.4	19.0
1961	47.7	6.8	14.3	13.9	17.3
1962	45.5	9.9	14.3	12.1	18.2
1963	44.0	7.2	13.8	14.6	20.4
1964	50.7	6.9	9.9	12.8	19.7
1965	51.0	8.0	10.7	12.1	18.2
1966	52.7	6.8	10.3	10.6	19.6
1967	48.4	5.9	11.5	11.6	22.6
1968	48.2	7.7	13.8	15.6	14.7
1969	49.8	7.1	11.9	14.7	16.5
1970	52.7	8.1	10.5	13.2	15.5
1971	48.5	10.8	12.0	15.5	13.2
1972	40.5	8.4	15.2	16.5	19.4
1973	43.1	6.9	13.4	16.8	19.8
1974	47.9	6.3	13.4	17.7	14.7
1975	43.8	6.4	19.7	18.7	11.4
1976	38.2	8.9	20.5	20.3	12.2
1977	39.4	8.3	19.7	20.7	11.9
1978	43.4	7.3	18.1	18.3	12.9
1979	42.3(b)	8.2(c)	17.6	17.9	14.0
1980(r)	40.2(b)	6.7(c)	18.6	19.6	14.8
1981(p)	41.5(b)	7.0(c)	19.3	19.7	12.6

p - Preliminary. r - Revised.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses.

(c) Includes forging presses.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS
By Type of Machine
Total Shipments and Unfilled Orders, 1970 to Date

	SHIPMENTS			UNFILLED ORDERS December 31		
	Number of Machines	Millions of Dollars		Number of Machines	Millions of Dollars	
		Machines & Controls	Controls Only		Machines & Controls	Controls Only
TOTAL						
1970(a)	1,901	$ 209.0	$50.1	683	$121.8	$26.3
1971(a)	1,238	153.2	36.0	581	107.7	23.3
1972(a)	1,630	170.1	42.3	1,334	182.1	50.6
1973(a)	2,865	272.1	(b)	(b)	(b)	(b)
1974(a)	4,210	378.7	(b)	(b)	(b)	(b)
1975(a)	4,136	504.7	(b)	(b)	(b)	(b)
1976(a)	3,856	501.0	(b)	(b)	(b)	(b)
1977(a)	4,482	496.7	(b)	(b)	(b)	(b)
1978(a)	5,688	649.2	(b)	(b)	(b)	(b)
1979(r,g)	7,925	1,014.6	(b)	(b)	(b)	(b)
1980(r,g)	9,984	1,371.6	(b)	(b)	(b)	(b)
1981(p,g)	8,926	1,467.9	(b)	(b)	(b)	(b)
Boring Machines						
1970	175	29.5	7.6	74	15.6	3.5
1971	92	18.4	4.6	74	23.7	5.0
1972	84	21.0	4.1	126	30.0	12.2
1973	128	26.8	(b)	(b)	(b)	(b)
1974	146	33.7	(b)	(b)	(b)	(b)
1975	153	39.4	(b)	(b)	(b)	(b)
1976	120	35.6	(b)	(b)	(b)	(b)
1977	101	33.0	(b)	(b)	(b)	(b)
1978	127	47.3	(b)	(b)	(b)	(b)
1979	186	69.6	(b)	(b)	(b)	(b)
1980	226	92.5	(b)	(b)	(b)	(b)
1981(p)	293	120.2	(b)	(b)	(b)	(b)
Drilling Machines						
1970	215	13.0	2.7	48	5.8	1.0
1971	138	11.3	2.1	37	3.2	0.6
1972	118	8.4	1.6	25	4.3	0.7
1973	326	19.0	(b)	(b)	(b)	(b)
1974	216	11.7	(b)	(b)	(b)	(b)
1975	100	11.0	(b)	(b)	(b)	(b)
1976	197	13.2	(b)	(b)	(b)	(b)
1977	288	20.0	(b)	(b)	(b)	(b)
1978	321	22.0	(b)	(b)	(b)	(b)
1979	237	17.7	(b)	(b)	(b)	(b)
1980(r)	384	33.4	(b)	(b)	(b)	(b)
1981(p)	455	52.8	(b)	(b)	(b)	(b)
Lathes						
1970	507	55.3	17.3	273	37.4	10.9
1971	428	50.4	15.0	245	37.5	9.9
1972	570	67.1	19.7	578	66.3	20.9
1973	1,031(c)	95.2(c)	(b)	(b)	(b)	(b)
1974	1,381	137.3	(b)	(b)	(b)	(b)
1975	1,640	212.7	(b)	(b)	(b)	(b)
1976	1,321	205.9	(b)	(b)	(b)	(b)
1977	1,178	195.3	(b)	(b)	(b)	(b)
1978	1,464	237.2	(b)	(b)	(b)	(b)
1979	2,362	347.7	(b)	(b)	(b)	(b)
1980	2,739	481.2	(b)	(b)	(b)	(b)
1981(p)	2,021	441.4	(b)	(b)	(b)	(b)

(Continued)

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS
By Type of Machine
Total Shipments and Unfilled Orders, 1970 to Date
(Continued)

	SHIPMENTS			UNFILLED ORDERS December 31		
	Number of Machines	Millions of Dollars		Number of Machines	Millions of Dollars	
		Machines & Controls	Controls Only		Machines & Controls	Controls Only
Milling Machines (d)						
1970	150	$ 23.4	$ 3.6	38	$ 13.0	$ 2.0
1971	105	12.6	2.4	27	8.8	1.2
1972	229	15.8	3.3	83	11.0	1.7
1973	240	16.1	(b)	(b)	(b)	(b)
1979	2,045	93.8	(b)	(b)	(b)	(b)
1980	2,600	162.7	(b)	(b)	(b)	(b)
1981(p)	1,763	190.6	(b)	(b)	(b)	(b)
Machining Centers						
1970	651	68.9	15.7	169	29.9	6.4
1971	344	46.6	9.5	171	30.7	6.1
1972	475	45.3	11.4	434	61.8	13.3
1973	1,162	115.1	(b)	(b)	(b)	(b)
1974	1,692	163.1	(b)	(b)	(b)	(b)
1975	1,460	196.8	(b)	(b)	(b)	(b)
1976	1,225	178.4	(b)	(b)	(b)	(b)
1977	1,201	175.0	(b)	(b)	(b)	(b)
1978	1,486	246.0	(b)	(b)	(b)	(b)
1979	1,953	356.5	(b)	(b)	(b)	(b)
1980(r)	2,132	413.0	(b)	(b)	(b)	(b)
1981(p)	2,081	482.7	(b)	(b)	(b)	(b)
Grinding and Polishing Machines						
1979	206	28.6	(b)	(b)	(b)	(b)
1980(r)	271	32.9	(b)	(b)	(b)	(b)
1981(p)	645	46.7	(b)	(b)	(b)	(b)
All Other Metal Cutting and Metal Forming Type Machine Tools						
1970	203	19.0	3.2	81	20.0	2.4
1971	131	13.9	2.4	27	3.8	0.5
1972	154	12.6	2.3	88	8.5	1.7
1973	17(a,e)	5.0(a,e)	(b)	(b)	(b)	(b)
1974	775(a,f)	32.8(a,f)	(b)	(b)	(b)	(b)
1975	783(a,f)	44.8(a,f)	(b)	(b)	(b)	(b)
1976	993(a,f)	67.9(a,f)	(b)	(b)	(b)	(b)
1977	1,714(a,f)	73.4(a,f)	(b)	(b)	(b)	(b)
1978	2,290(a,f)	96.7(a,f)	(b)	(b)	(b)	(b)
1979(r)	936(g)	100.7(g)	(b)	(b)	(b)	(b)
1980(r)	1,632(g)	155.9(g)	(b)	(b)	(b)	(b)
1981(p)	1,668(g)	133.5(g)	(b)	(b)	(b)	(b)

p - Preliminary. r - Revised.

(a) No metal forming NC data are included.
(b) Beginning with 1973, data no longer published.
(c) Includes data for grinding and polishing machines.
(d) For 1974-1978 data were included in the "All Other" category.
(e) For 1973 only, grinding and polishing machines are reported with lathes and are not included in the "All Other" category.
(f) Includes milling machines and grinding and polishing machines.
(g) Includes data for punching, shearing, bending, and forming machines; all other metal forming NC data withheld to avoid disclosure.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

NUMERICALLY CONTROLLED AND AUTOMATIC METALWORKING MACHINERY
By Type of Control
Total Shipments and Unfilled Orders, 1964 to 1972 (a)

	SHIPMENTS			UNFILLED ORDERS December 31		
	Number of Machines	Millions of Dollars		Number of Machines	Millions of Dollars	
		Machines & Controls	Controls Only		Machines & Controls	Controls Only
TOTAL						
1964	1,517	$105.5	$29.2	987	$113.7	$26.4
1965	2,100	159.3	43.9	1,964	211.3	57.1
1966	2,939	249.1	55.5	2,439	329.3	75.7
1967	2,957	284.9	69.4	2,054	337.9	72.1
1968	2,917	353.8	81.2	1,336	253.8	53.3
1969	2,376	293.9	70.2	1,148	172.3	36.9
1970	1,901	209.0	50.1	683	121.8	26.3
1971	1,238	153.2	36.0	581	107.7	23.3
1972	1,630	170.1	42.3	1,334	182.1	50.6
Point-to-Point Positioning						
1964	1,145	52.4	15.0	586	43.9	12.2
1965	1,604	89.0	25.9	1,278	93.5	25.6
1966	2,044	126.4	26.1	1,422	139.0	33.4
1967	2,050	143.0	36.1	1,033	100.3	24.0
1968	1,752	141.6	34.8	530	67.3	16.4
1969	1,324	110.2	27.6	507	54.7	12.8
1970	1,033	82.3	19.2	222	38.3	7.7
1971	476	50.4	11.2	146	30.3	8.2
1972	605	49.5	10.4	337	50.8	15.7
Continuous Path Activated by Tape or Punch Card						
1964	172	36.7	11.2	151	35.0	10.7
1965	229	43.7	13.8	383	86.1	25.7
1966	524	79.5	22.9	637	151.4	33.8
1967	621	113.2	27.3	782	211.4	41.4
1968	991	196.2	43.2	700	176.6	34.5
1969	899	171.0	39.8	577	108.6	22.7
1970	785	118.9	29.5	423	78.4	17.9
1971	711	97.6	23.8	425	76.6	16.9
1972	989	117.4	31.3	977	128.3	34.4
Dial or Plug Board Type of Prerecorded Motion Program Control						
1964	200	16.4	3.0	250	34.8	3.5
1965	267	26.6	4.2	303	31.7	5.8
1966	371	43.2	6.5	380	38.9	8.5
1967	286	28.7	6.0	239	26.2	6.7
1968	174	14.0	3.2	106	9.9	2.4
1969	153	12.7	2.8	64	9.0	1.4
1970	83	7.9	1.4	38	5.1	0.7
1971	51	5.2	0.9	10	0.8	0.2
1972	36	3.3	0.6	20	3.0	0.4

(a) The publication of this data was discontinued in 1973.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BORING MACHINES
Units and Value, 1974 to Date

Products	1974	1975	1976	1977	1978	1979(r)	1980(r)	1981(p)
UNITS								
TOTAL	929	767	662	761	922	1,671	1,793	1,833
Horizontal Boring, Drilling & Milling Machines								
Table Type	162	136	175	81	104	97	102	115
Floor Type				88	85	82	72	104
Precision Boring Machines	767	631	487	509	648	868	771	661
Jig Boring Machines				83	85	624	848	953
All Other Boring Machines				—				
VALUE (Millions of Dollars)								
TOTAL	$81.3	$83.9	$77.8	$84.9	$117.7	$177.7	$192.0	$231.6
Horizontal Boring, Drilling & Milling Machines								
Table Type	32.8	32.1	40.6	23.3	35.6	38.1	41.4	53.0
Floor Type				15.4	15.3	21.4	23.8	16.2
Precision Boring Machines	48.5	51.8	37.2	32.0	50.2	87.8	96.3	122.1
Jig Boring Machines				14.2	16.6	30.1	30.5	40.4
All Other Boring Machines				—				

p - Preliminary. r - Revised.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GEAR CUTTING MACHINES
Units and Value, 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980	1981(p)
UNITS								
TOTAL	1,006	849	509	624	878	828	931	837
Gear Tooth Finishing Machines(a)	1,006	849	509	384	488	646	648	576
Gear Hobbers-Horizontal and Vertical(b)				240	390	182	283	261
All Other Gear Cutting Machines				0	0	(c)	(c)	(c)
VALUE (Millions of Dollars)								
TOTAL	$66.2	$65.1	$56.0	$61.4	$102.7	$111.2	$130.3	$133.1
Gear Tooth Finishing Machines (a)	66.2	65.1	56.0	42.8	66.2	91.3	97.6	101.6
Gear Hobbers-Horizontal and Vertical (b)				18.6	36.4	19.9	32.7	31.5
All Other Gear Cutting Machines				0	0	(c)	(c)	(c)

p - Preliminary.

(a) Includes bevel gear generators.
(b) Includes gear shapers.
(c) Included in gear tooth finishing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF DRILLING MACHINES
Units and Value, 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980(r)	1981(p)
UNITS								
TOTAL	55,493	45,028	40,664	42,815	52,247	44,697	34,965	27,202
Average Value Under $1,000	50,942	39,729	36,154	36,971	49,412(a)	41,476(a)	31,474(a)	24,141(a)
Average Value $1,000 and Over	4,551	5,299	4,510	5,844	2,835(b)	3,221(b)	3.491(b)	3,061(b)
Sensitive Drilling Machines								
Bench Type	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
Floor and Pedestal Type	357	D	D	D	D			
Vertical Drilling Machines								
Plain Upright	1,189	1,063	929	1,530	438	1,339(f)	1,089(f)	892(f)
Indexing Turret Head, Heavy Duty and Other	1,012	921	289(e)E	249(e)	277(e)			
Radial Drilling Machines								
Plain and Universal Under 13"	150	240	175	68	54	226	232	331
All Other	D	D	D	D	D			
Deep Hole Drilling Machines	(c)	(c)	(c)	(c)	(c)	184	190	154
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center and Rail Mounted	337(d)	763(d)	502(d)	301(d)E	290(d)	378(d)	628(d)	520(d)
Automatic Drilling	516			D	598	797	(c)	(c)
All Other	D	D	112	105	D			
All Other Drilling Machines	849	1,840	1,835	2,202	256	297	1,352	1,164
VALUE (Millions of Dollars)								
TOTAL	$77.9	$92.8	$100.4	$107.2	$152.4	$150.5	$186.9	$139.9
Average Value Under $1,000	13.1	12.2	13.2	12.8	22.2(a)	25.9(a)	18.6(a)	20.2(a)
Average Value $1,000 & Over	64.8	80.6	87.2	94.4	130.2(b)	124.6(b)	168.3(b)	119.7(b)
Sensitive Drilling Machines								
Bench Type	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
Floor and Pedestal Type	2.8	D	D	D	D			
Vertical Drilling Machines								
Plain Upright	3.8	4.2	3.3	3.9	2.6	18.2(f)	22.7(f)	22.1(f)
Indexing Turret Head, Heavy Duty and Other	9.5	11.6	6.4(e)E	5.9(e)	7.5(e)			
Radial Drilling Machines								
Plain and Universal Under 13"	2.3	2.9	2.7	2.1	1.7	9.7	12.6	14.0
All Other	D	D	D	D	D			
Deep Hole Drilling Machines	(c)	(c)	(c)	(c)	(c)	5.8	10.6	15.7
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center and Rail Mounted	7.5(d)	29.7(d)	43.9(d)	13.5(d)E	11.6(d)	21.1(d)	26.2(d)	20.0(d)
Automatic Drilling	17.5			D	67.0	57.0	(c)	(c)
All Other	D	D	11.5	6.4	D			
All Other Drilling Machines	14.4	15.6	8.7	11.2	9.5	18.6	96.2	47.9

p - Preliminary. r - Revised. D - Withheld to avoid disclosure. E - Estimate by NMTBA.

(a) Average value under $2,500.
(b) Average value $2,500 and over.
(c) Included with "All Other Drilling Machines".
(d) Rail mounted included with "All Other Multiple Spindle Drilling Machines".
(e) Includes only heavy duty. Disclosure was reported for indexing turret head and other.
(f) Includes all vertical drilling machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Units and Value, 1971 to 1978

Products	1971(c)	1972(c)	1973(c)	1974(c)	1975(c)	1976(c)	1977(c)	1978(c)
UNITS								
TOTAL	11,071	12,295	16,904	19,305	17,581	14,085	11,249	13,557
Average Under $1,000	D	D	D	D	D	D	D	D(a)
Average $1,000 and Over	D	D	D	D	D	D	D	D(b)
Bench Lathes (Except Bench Turret Lathes)	D	D	(e)	(e)	(e)	(e)	(e)	(e)
Manufacturing and Tool Room Lathes								
Engine & Tool Room (Light and Heavy), Floor Mounted								
Up to and Including 16" Swing Over Cross Slide	4,317	4,383	6,611	3,929(f)	3,836(f)	2,869(f)	4,510	3,640
17" to 23" Swing	139	126	285	(g)	(g)	(g)	157E	141
24" Swing and Over	61	53	52	296	321	300	D	
All Other Mfg. and Tool Room	D	D	D	D	D	D	1,804	1,965
Turret Lathes								
Bench and Floor Light Duty Type	1,052(d)	665(d)	D	D	D	D	D	D
Ram Type	100E							
Automatic Chucking Lathes								
Single Spindle	351	547	828	896	1,050	637(h)E	790(h)	1,076(h)
Multiple Spindle	231	182	270	248	214	174	214	255
Automatic Between Center Lathes	88	107	217	236	179	99	141	174
Screw (bar) Machines	933	1,107	1,434	1,676	1,189	1,051(i)E	696(i)	782(i)
Vertical Turning and Boring Mills	87E	98E	108	153	183	171	121	129
All Other	631	465	1,893	505	448	701	712	846
VALUE (Millions of Dollars)								
TOTAL	$174.9	$203.2	$299.0	$370.2	$464.2	$430.3	$436.3	$535.9
Average Under $1,000	D	D	D	D	D	D	D	D(a)
Average $1,000 and Over	D	D	D	D	D	D	D	D(b)
Bench Lathes (Except Bench Turret Lathes)	D	D	(e)	(e)	(e)	(e)	(e)	(e)
Manufacturing and Tool Room Lathes								
Engine & Tool Room (Light and Heavy), Floor Mounted								
Up to and Including 16" Swing Over Cross Slide	26.3	28.4	48.8	50.5(f)	55.9(f)	54.6(f)	53.4	64.0
17" to 23" Swing	6.3	4.0	10.4	(g)	(g)	(g)	11.1E	18.4
24" Swing and Over	6.5	6.5	3.8	20.7	31.8	30.6	D	
All Other Mfg. and Tool Room	D	D	D	D	D	D	18.7	23.1
Turret Lathes								
Bench and Floor Light Duty Type	15.1(d)	22.0(d)	D	D	D	D	D	D
Ram Type	2.7E							
Automatic Chucking Lathes								
Single Spindle	21.3	27.3	47.7	60.2	82.6	59.4(h)E	72.2(h)	100.9(h)
Multiple Spindle	20.9	17.0	30.1	27.6	32.3	30.6	37.9	50.2
Automatic Between Center Lathes	5.4	8.0	14.5	19.0	18.6	13.4	23.0	31.4
Screw (bar) Machines	36.3	42.8	56.9	70.1	73.7	52.9(i)E	61.4(i)	71.5(i)
Vertical Turning and Boring Mills	18.4E	20.7E	20.2	30.9	42.3	46.1	38.5	42.2
All Other	12.1	20.3	30.6	26.3	38.7	26.7	29.9	48.1

E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average Under $2,500.
(b) Average $2,500 and over.
(c) Data for specific machines limited to machines valued at $1,000 or over through 1977, $2,500 or over beginning in 1978.
(d) Includes saddle type.
(e) Included with "All Other".
(f) Excludes 8" and under.
(g) Included with 24" Swing and Over.
(h) Includes single spindle with index turret only. Disclosure was reported for single spindle without index turret.
(i) Includes multiple spindle only. Disclosure was reported for single spindle.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES

Units and Value, 1979 to Date

(Millions of Dollars)

Products	1979	1980(r)	1981(p)
UNITS			
TOTAL	20,107	17,937	16,896
NUMERICALLY CONTROLLED AVERAGE OVER $2,500			
Turning Machines-Horizontal Spindle			
Small	1,293	1,532	977
Medium	766	768	541
Large	121	224	266
Turning Machines-Vertical Spindle	182	215	237
Turret Lathes & Boring Machines over 30"			
All Other			
NON-NUMERICALLY CONTROLLED			
AVERAGE UNDER $2,500	D	D	D
AVERAGE $2,500 and Over	D	D	D
Manufacturing and Tool Room Lathes, Engine and Tool Room (Light and Heavy) Floor Mounted			
Up to and Including 16" Swing Over Cross Slide	3,200	2,211	2,653
17" to 23" Swing	288	246	240
24" and Over			
All Other Engine and Tool Room			
Turret Lathes, Horizontal Type	916	1,063	D
Automatic Lathes-Single Spindle			
Bar (Screw) Machines	D	D	D
Chucking Machines	563	561	357
Automatic Lathes-Multiple Spindle			
Bar (Screw) Machines	759	848	809
Chucking Machines	146	176	131
Automatic Between Center Lathes	87	115	182
All Other Horizontal Turning Machines			
Vertical Turret Lathes and Boring Machines	246	D	D
All Other Vertical Turning Machines	D	D	D
All Other Non-Numerically Controlled	D	D	D
VALUE (Millions of Dollars)			
TOTAL	$650.3	$827.0	$816.8
NUMERICALLY CONTROLLED AVERAGE OVER $2,500			
Turning Machines-Horizontal Spindle			
Small	107.9	167.0	134.2
Medium	147.0	168.5	128.7
Large	29.5	64.5	83.7
Turning Machines-Vertical Spindle	63.3	81.1	94.8
Turret Lathes & Boring Machines over 30"			
All Other			
NON-NUMERICALLY CONTROLLED			
AVERAGE UNDER $2,500	D	D	D
AVERAGE $2,500 and Over	D	D	D
Manufacturing and Tool Room Lathes, Engine and Tool Room (Light and Heavy) Floor Mounted			
Up to and Including 16" Swing Over Cross Slide	36.8	26.2	27.9
17" to 23" Swing	17.7	29.0	27.8
24" and Over			
All Other Engine and Tool Room			
Turret Lathes, Horizontal Type	15.0	17.3	D
Automatic Lathes-Single Spindle			
Bar (Screw) Machines	D	D	D
Chucking Machines	29.3	32.8	26.1
Automatic Lathes-Multiple Spindle			
Bar (Screw) Machines	80.5	89.9	99.6
Chucking Machines	25.2	33.5	30.9
Automatic Between Center Lathes	12.2	25.8	46.8
All Other Horizontal Turning Machines			
Vertical Turret Lathes and Boring Machines	5.7	D	D
All Other Vertical Turning Machines	D	D	D
All Other Non-Numerically Controlled	D	D	D

D - Withheld to avoid disclosure. r - Revised. p - Preliminary.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery".

SHIPMENTS OF GRINDING AND POLISHING MACHINES (a)

Units, 1974 to Date

Products	1974(b)	1975(b)	1976(b)	1977(b)	1978(b)	1979(b)	1980(b,r)	1981(b,p)
UNITS								
TOTAL	110,295	102,336	86,315	95,234	110,202	107,288	97,004	91,552
Average Value Under $1,000	94,877	87,923	72,243	80,484	91,373	89,238	79,509	76,699
Average Value $1,000 and Over	15,419	14,413	14,072	14,750	18,829	18,050	17,495	14,853
External Cylindrical Grinding Machines								
Plain	257	257	(e)	172	247	325	297	383
Universal	271	223	231	204	226	313	305	291
Roll and Centerless	749	642	298(c)	(e)	546(c)	821	935	881
All Other			764	781				
Internal Cylindrical Grinding Machines	(e)	(e)			(e)	(e)	(e)	(e)
Surface Grinding Machines								
Rotary Table Type	299	440	283	271	289	397	348	264
Reciprocating Table Type								
Vertical and Horizontal	1,887(d)	1,491(d)	1,523(d)	1,632(d)	1,921(d)	2,217	2,941	1,850
Hand Surface Type	3,080	1,722	1,836	2,581	2,839	3,147	3,523	1,822
Planer Type and All Other	(e)	(e)	(e)	(e)	(e)		(e)	(e)
Bench, Floor and Snag Grinders	1,398	1,668	1,367	1,066	1,359	728	537	484
Tool and Cutter Grinding Machines								
Universal	1,860	1,906	1,924	2,079	2,111	2,367	2,610	2,818
Special								
Polishing and Buffing Machines								
Floor Types	(e)	(e)	372E	372	849	543	326	294
All Other	668	397	647	1,102	2,011	2,083	1,581	1,501
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	2,345	2,145	3,059	2,445	1,667	2,154	1,871(h)	1,516(h)
All Other Honing and Lapping Machines					362	535	370	354
All Other	2,605(f)	3,522(f)	1,768E(g)	2,045(g)	4,402(g)	2,420(g)	1,851(g)	2,395(g)

p - Preliminary. r - Revised. E - Estimated.

(a) Except gear-tooth grinding, lapping, polishing, and buffing machines.

(b) Data for specific machines limited to machines valued at $1,000 or over through 1977 and $2,500 or over beginning in 1978.

(c) Includes chucking grinders.

(d) Includes "Horizontal" only, disclosure was reported for "Vertical".

(e) Included in "All Other Grinding Machines".

(f) Includes internal cylindrical grinding, surface grinding-vertical reciprocating, planer type and all other, and floor polishing and buffing machines, and Other Grinding Machines, N.E.C. Includes thread grinding machines from 1974 to date.

(g) Includes surface grinding-vertical reciprocating, planer type and all other, and Other Grinding Machines, N.E.C.

(h) Does not include external honing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES (a)

Value, 1974 to Date

Products	1974(b)	1975(b)	1976(b)	1977(b)	1978(b)	1979(b)	1980(b,r)	1981(b,p)
VALUE (Millions of Dollars)								
TOTAL	$249.9	$273.2	$246.8	$273.1	$348.6	$474.9	$555.8	$614.2
Average Value Under $1,000	11.5	11.5	11.1	12.3	11.6	16.8	16.8	17.8
Average Value $1,000 and Over	238.4	261.7	235.7	260.8	337.0	458.1	539.0	596.4
External Cylindrical Grinding Machines								
Plain	16.8	22.8	(e)	19.0	33.6	43.5	42.1	63.9
Universal	6.8	7.7	10.2	9.7	12.0	17.2	17.7	18.6
Roll and Centerless	55.6	60.3	31.0(c)	(e)	64.4(c)	107.5	132.0	161.2
All Other		46.7	46.7	50.6				
Internal Cylindrical Grinding Machines	(e)	(e)			(e)	(e)	(e)	(e)
Surface Grinding Machines								
Rotary Table Type	14.4	19.4	11.5	14.5	21.2	35.3	36.7	36.5
Reciprocating Table Type								
Vertical and Horizontal	17.0(d)	16.7(d)	18.5(d)	21.1(d)	27.4(d)	35.3	49.1	37.7
Hand Surface Type	10.8	6.6	8.3	11.6	13.3	16.8	21.6	13.8
Planer Type and All Other	(e)	(e)	(e)	(e)	(e)		(e)	(e)
Bench, Floor and Snag Grinders	12.0	14.3	12.0	12.6	16.9	7.5	6.2	7.3
Tool and Cutter Grinding Machines								
Universal	12.9	13.7	16.7	19.0	19.7	26.0	32.5	36.4
Special								
Polishing and Buffing Machines								
Floor type	(e)	(e)	8.8E	7.5	8.4	10.9	5.8	7.2
All Other	7.8	6.4	11.1	19.0	20.6	24.1	28.8	33.2
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	17.7	21.1	22.3	21.9	15.7	20.4	29.1(h)	28.3(h)
All Other Honing and Lapping Machines					9.4	10.7	11.7	13.9
All Other	66.6(f)	72.7(f)	38.6E(g)	54.3(g)	74.4(g)	102.9(g)	125.7(g)	138.4(g)

p - Preliminary. r - Revised. E - Estimated.

(a) Except gear-tooth grinding, lapping, polishing, and buffing machines.
(b) Data for specific machines limited to machines valued at $1,000 or over through 1977 and $2,500 or over beginning in 1978.
(c) Includes chucking grinders.
(d) Includes "Horizontal" only, disclosure was reported for "Vertical".
(e) Included in "All Other Grinding Machines".
(f) Includes internal cylindrical grinding, surface grinding-vertical reciprocating, planer type and all other, and floor type polishing and buffing machines, and Other Grinding Machines, N.E.C. Includes thread grinding machines from 1974 to date.
(g) Includes surface grinding-vertical reciprocating, planer type and all other, floor type polishing and buffing machines, and Other Grinding Machines, N.E.C.
(h) Does not include external honing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Units, 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980(r)	1981(p)
UNITS								
TOTAL	65,813	51,736	59,764	56,855	65,239	70,922	76,703	77,218
Average Value Under $1,000	44,326	29,475	44,997	41,163	53,432(a)	59,852(a)	64,819(a)	63,234(a)
Average Value $1,000 and Over	21,487	22,261	14,767	15,118	11,807(b)	11,070(b)	11,884(b)	13,984(b)
Broaching Machines								
Hydraulic	231	193E	198	166	239	295	269	204
Mechanical and Other								
Planers, Shapers (Except Gear) and Slotters	D	77E		D	D	(c)	(c)	(c)
Sawing and Cutoff Machines								
Power Hack Saws	D	1,055	343E	747E	433	453	556	509
Circular Cutoff Saws	196	243	1,002	879	164	134	142	145
Abrasive Cutoff Saws	2,348	2,612			598	499	526	497
Band Saw	10,906	11,366	6,487	7,080	2,889	3,874	4,223	6,416
Contour Sawing and Filing Machines	1,216	959	1,030E	D	D	970	619	840
All Other				342	226			
Tapping Machines	634	378	411	328	264	303	286	412
Multi-Function N/C Machines:								
Drill, Mill, Bore:								
Manual Tool change-Vert. & Horizontal				311	327	(f)	(f)	(f)
Indexing Turret	1,232	961	796					
Automatic Tool change								
Vertical				482	611			
Horizontal	460	499	429	408	548			
Transfer Machines								
Dial or Rotary	923	1,026	803	885	960	130	384	515
Way Type						91	126	64
Station Type, Transfer						574	517	439
Other, N.E.C.						203	218	185
Electrical Discharge Machines (EDM)	884	722	837	1,043	1,423	1,857	2,234	1,725
Electrochemical Machines (EMC)	1,655(d,e)	2,170(e)	2,431(e)	2,219(e)	3,125(e)			
All Other Metal Cutting Machines						1,687	1,784	2,033

p - Preliminary. r - Revised. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average value under $2,500.
(b) Average value $2,500 or more.
(c) Included with "All Other".
(d) Excludes planers which were reported as D.
(e) Includes threading machines.
(f) Beginning with 1979 there is a new classification for Machining Centers.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Value, 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980(r)	1981(p)
VALUE (Millions of Dollars)								
TOTAL	$542.3	$677.1	$546.6	$668.1	$756.1	$836.6	$1,072.2	$1,196.9
Average Value Under $1,000	23.6	13.1	18.0	20.7	28.3(a)	28.6(a)	31.6(a)	25.4(a)
Average Value $ 1,000 and Over	518.8	664.0	528.6	647.4	727.8(b)	808.0(b)	1,040.6(b)	1,171.5(b)
Broaching Machines								
Hydraulic	16.7	23.9E	12.1	20.5	25.7	31.6	33.6	36.0
Mechanical and Other								
Planers, Shapers (Except Gear) and Slotters	D	1.7E		D	D	(c)	(c)	(c)
Sawing and Cutoff Machines								
Power Hack Saws	D	1.9	1.5E	2.4E	2.2	3.4	3.4	3.2
Circular Cutoff Saws	4.8	8.9	12.6	9.9	7.6	10.6	11.6	22.2
Abrasive Cutoff Saws	5.5	3.5			3.5	3.1	4.7	5.5
Band Saws	20.0	27.2	27.6	32.0	32.1	43.6	50.9	57.1
Contour Sawing and Filing Machines	11.5	11.4	14.0E	D	D	18.4	20.5	24.0
All Other				12.0	9.9			
Tapping Machines	5.5	4.4	5.2	3.8	3.3	4.8	6.7	7.2
Multi-Function N/C Machines:								
Drill, Mill, Bore:								
Manual Tool Change-Vert. & Horizontal	74.0	83.8	75.0	27.3	31.3	(f)	(f)	(f)
Indexing Turret								
Automatic Tool Change								
Vertical				54.4	71.8			
Horizontal	89.1	112.9	103.4	93.4	142.9			
Transfer Machines	258.5	354.6	223.0	318.9	322.5			
Dial or Rotary						29.9	60.0	75.6
Way Type						22.2	32.8	38.7
Station Type, Transfer						494.9	592.6	684.5
Other, N.E.C.						60.6	108.1	102.8
Electrical Discharge Machines (EDM)	17.4	15.7	17.2	19.0	29.0	45.7	78.1	66.9
Electrochemical Machines (ECM)	12.4(d,e)	14.1(e)	37.0(e)	37.5(e)	46.0			
All Other Metal Cutting Machines						39.2	37.6	47.8

p - Preliminary. r - Revised. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average value under $2,500.
(b) Average value $2,500 or over.
(c) Included with "All Other".
(d) Excludes planers, which were reported as D.
(e) Includes threading machines.
(f) Beginning with 1979 there is a new classification for Machining Centers on the following page.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MACHINING CENTERS
Units and Value, 1979 to date

Products	1979	1980(r)	1981(p)
UNITS			
TOTAL	1,953	2,132	2,081
Average Value over $2,500			
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	312	298	263
Drill, Mill, Bore-Vertical (Automatic Tool Change)			
Y-axis Travel Less Than 20 Inches	(a)	(a)	(a)
Y-axis Travel 20 Inches—26 Inches	365	531	539
Y-axis Travel Over 26 Inches	188	238	280
Drill, Mill, Bore-Horizontal (Automatic Tool Change)			
Y-axis Travel Less Than 27 Inches	441	434	429
Y-axis Travel 27 Inches—40 Inches	217	205	233
Y-axis Travel Over 40 Inches	123	138	127
All Other Machining Centers	307(b)	288(b)	210(b)
VALUE (Millions of Dollars)			
TOTAL	$356.5	$413.0	$482.7
Average Value over $2,500			
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	30.8	32.1	32.4
Drill, Mill, Bore-Vertical (Automatic Tool Change)			
Y-axis Travel Less Than 20 inches	(a)	(a)	(a)
Y-axis Travel 20 Inches—26 inches	45.7	73.8	84.7
Y-axis Travel Over 26 inches	33.9	46.7	59.4
Drill, Mill, Bore-Horizontal (Automatic Tool Change)			
Y-axis Travel Less Than 27 inches	85.9	92.2	106.7
Y-axis Travel 27 Inches—40 Inches	63.9	64.1	88.3
Y-axis Travel Over 40 Inches	69.5	75.9	80.8
All Other Machining Centers	26.8(b)	28.2(b)	30.4(b)

p - Preliminary. r - Revised.

(a) Included in All Other Machining Centers.

(b) This category includes Y axis Travel Less than 20", Machining centers with automatic multiple spindle head changing capability and all other machining centers.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980(r)	1981(p)
UNITS								
TOTAL	19,969	10,872	10,758	12,479	14,602	15,553	17,098	17,193
Average Value Under $1,000	D	D	D	D	D	1,693(a)	1,640(a)	1,349(a)
Average Value $1,000 and Over	D	D	D	D	D	13,860	15,458	15,844
Knee Type Milling Machines (Except Bench)								
Horizontal	D	D	D	10,365	11,872	13,216	14,852	15,275
Plain								
Universal								
Vertical & All Other Knee Type								
Ram Type								
Bed Type Milling Machines	800	872	729E	644E	633			
Profile Machines and Duplicators	274	257	240	208	197	210	279	286
Die Sinking Machines	D	D	157E	D	D	229	327	283
All Other Milling Machines	206	132	151	183	114	205		
VALUE (Millions of Dollars)								
TOTAL	$137.7	$134.0	$134.4	$160.2	$194.3	$279.8	$339.3	$436.6
Average Value Under $1,000	D	D	D	D	D	1.0(a)	1.0(a)	1.0(a)
Average Value $1,000 and Over	D	D	D	D	D	278.9	338.3	435.6
Knee Type Milling Machines (Except Bench)								
Horizontal	D	D	D	93.9	111.6	174.1	215.1	231.3
Plain								
Universal								
Vertical and All Other Knee Types								
Ram Type								
Bed Type Milling Machines	17.9	22.9	17.3E	15.7E	28.9			
Profile Machines and Duplicators	9.5	15.2	18.4	18.5	14.9	66.9	96.8	157.3
Die Sinking Machines	D	D	1.5E	D	D	2.2	26.3	47.0
All Other Milling Machines	30.1	19.7	25.9	30.6	36.1	35.7		

E - Estimate by NMTBA. p - Preliminary. r - Revised. D - Withheld to avoid disclosure.

(a) Average value under $2,500.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES

Units and Value, 1979 to Date

(Millions of Dollars)

Products	1979	1980(r)	1981(p)
UNITS			
TOTAL	15,553	17,098	17,193
All milling machines valued under $2,500 each	1,693	1,640	1,349
All milling machines valued at $2,500 each or more:	13,860	15,458	15,844
General-purpose, knee or bed:			
Horizontal plain, universal and ram	12,460	13,802	14,071
Vertical, except ram			
Vertical ram			
All other general-purpose type milling machines			
Automatic and manufacturing:			
Single spindle	425	483	356
Multiple spindle and special-purpose machines	331	567	848
Profile machines and duplicators	210	279	286
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	229	327	283
All other milling machines N.E.C.	205		
VALUE (Millions of Dollars)			
TOTAL	$279.8	$339.3	$436.6
All milling machines valued under $2,500 each	1.0	1.0	1.0
All milling machines valued at $2,500 each or more:	278.8	338.3	435.6
General-purpose, knee or bed:			
Horizontal plain, universal and ram	135.1	155.8	140.1
Vertical, except ram			
Vertical ram			
All other general-purpose type milling machines			
Automatic and manufacturing:			
Single spindle	21.9	27.8	37.3
Multiple spindle and special-purpose machines	17.0	31.6	53.9
Profile machines and duplicators	66.9	96.8	157.3
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	2.2	26.3	47.0
All other milling machines N.E.C.	35.7		

p - Preliminary. r - Revised.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

Units and Value, 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980(r)	1981(p)
UNITS								
TOTAL	64,988	51,172	58,118	64,566	69,813	82,199	75,336	67,701
Punching, Shearing, Bending and Forming	43,353	31,709	37,256	41,316	43,903	47,805	46,017	41,438
Punching and Shearing (a)	6,025	4,863	5,084	5,262	4,774	5,745	5,396	5,495
Bending and Forming (a)	10,489	8,118	8,419	11,796	10,388	9,791	9,242	7,623
Presses, Including Forging	13,271	13,517	14,302	16,194	16,655	24,418(b)	20,428(b)	18,046(b)
Presses, Including Forging (a)	NA	NA	NA	9,654	NA	7,432(b)	5,764(b)	4,139(b)
Other Metal Forming Machine Tools	8,364	5,946	6,560	7,056	9,255	9,976	8,891	8,217
VALUE (Millions of Dollars)								
TOTAL	$640.4	$615.7	$586.0	$662.1	$808.2	$1,026.8	$1,096.0	$1,079.2
Punching, Shearing, Bending and Forming	199.1	236.4	238.8	267.9	294.3	364.6	419.1	420.2
Punching and Shearing(a)	83.6	118.9	117.4	128.2	141.3	174.3	196.7	199.8
Bending and Forming(a)	105.2	109.2	112.4	130.9	139.0	171.2	202.6	199.5
Presses, Including Forging	307.0	269.5	223.6	260.7	350.9	434.0(b)	440.8(b)	447.5(b)
Presses, Including Forging(a)	NA	NA	NA	257.9	NA	422.1(b)	429.9(b)	436.5(b)
Other Metal Forming Machine Tools	134.3	109.9	123.6	133.6	163.7	228.2	236.1	211.5

p - Preliminary. NA - Not Available. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or more beginning in 1978. (Machine tools under $1,000 for 1974-1977 and under $2,500 for 1978 are not included so the individual items do not add to the totals.)

(b) Excludes Forging.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF HYDRAULIC AND PNEUMATIC METALWORKING PRESSES

Units and Value (a), 1974 to Date

Products	1974	1975	1976	1977	1978	1979(r)	1980(r)	1981(p)
UNITS								
Hydraulic and Pneumatic Presses								
Vertical Single Action Housing or Straight Side Type	NA	NA	NA	NA	NA	87	78	39
Column Type	208	144	203	170	174	433	443	347
Open Rod Type	242	165E	305E	348	392	NA	NA	NA
Gap or C-Frame	1,718	675	843	1,667	673			
15 Tons and Under						571	546	483
16-35 Tons						58	63	76
Over 35 Tons						166	140	77E
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses (b)	D	D	D	D	D	34	1,137(c)	700
All Other Hydraulic Presses	2,026(c)	2,477(c)	1,789(c)	1,611(c)	1,363(c)	1,871(c)		1,722(c)
VALUE (Millions of Dollars)								
Hydraulic and Pneumatic Presses								
Vertical Single Action Housing or Straight Side Type	NA	NA	NA	NA	NA	$18.7	$16.7	$16.3
Column Type	$15.4	$16.2	$5.3	$4.8	$16.2	9.2	11.7	8.5
Open Rod Type	3.9	4.3E	6.1E	8.7	9.4	NA	NA	NA
Gap or C-Frame	8.7	4.5	3.5	8.0	7.4			
15 Ton and Under						4.9	5.2	4.6
16-35 Tons						1.3	1.5	2.1
Over 35 Tons						7.8	6.7	4.4E
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses (b)	D	D	D	D	D	12.8	45.8(c)	50.8
All Other Hydraulic Presses	23.2(c)	26.9(c)	11.1(c)	17.3(c)	32.1(c)	30.7(c)		86.6(c)

p - Preliminary. D - Withheld to avoid disclosure. r - Revised. E - Estimate by NMTBA. NA - Not Available.

(a) Average value $1,000 or over through 1977, $2,500 or over beginning in 1978.
(b) Figures for some types included with "All Other Hydraulic Presses".
(c) Includes horizontal.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery".

SHIPMENTS OF MECHANICAL PRESSES
Units and Value (a), 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980(r)	1981(p)
UNITS								
Open Inclinable Gap Type								
50 Tons and Under	5,074	3,045	3,598	3,373	2,140	1,374	954	642
51 Tons and Over	1,590	791	653	898	929	1,096	820	535
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under	75	64	78	D	68E	59	57	90
201 to 300 Tons	37	D						
301 Tons and Over								
Two Point								
300 Tons and Under	421	220	206	292	285	313	244	149
301 Tons and Over	130	130	63	66	116	97	77	50
Four Point	D	D	D	D	D	(b)	(b)	(b)
Automatic High Speed								
50 Tons and Under	286	211	188	167	228	622	575	389
51 Tons and Over	360	317	384E	D	D			
Knuckle Joint	D	D	D	D	D	(b)	(b)	(b)
Horizontal								
Gap and Horn Type	530	333	338	386	306	322	352	242
Bulldozers and Transfer Feed Presses	260(c)	241	98	133	97	329	278	320
All Other Mechanical Presses								
VALUE (Millions of Dollars)								
Open Inclinable Gap Type								
50 Tons and Under	$20.6	$11.7	$13.2	$16.2	$16.0	$20.0	$15.9	$13.4
51 Tons and Over	29.8	19.5	17.5	27.2	29.3	38.8	35.1	27.2
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under	4.0	3.1	17.7	D	12.8E	13.9	13.2	20.7
201 to 300 Tons	7.7	D						
301 Tons and Over								
Two Point								
300 Tons and Under	26.9	15.5	15.8	27.4	24.3	26.7	31.3	23.0
301 Tons and Over	43.6	38.0	19.4	23.1	41.8	43.5	48.1	37.6
Four Point	D	D	D	D	D	(b)	(b)	(b)
Automatic High Speed								
50 Tons and Under	9.0	9.5	9.5	9.9	13.4	76.5	83.7	72.2
51 Tons and Over	28.7	23.9	36.5E	D	D			
Knuckle Joint	D	D	D	D	D	(b)	(b)	(b)
Horizontal								
Gap and Horn Type	7.2	6.9	6.2	7.1	9.7	9.2	10.0	5.6
Bulldozers and Transfer Feed Presses	23.8(c)	29.1	12.1	22.1	30.5	108.1	104.9	150.3
All Other Mechanical Presses								

p - Preliminary. E - Estimate by NMTBA. D - Withheld to avoid disclosure. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or over beginning in 1978.
(b) Included with "All Other Mechanical Presses".
(c) Includes double and triple action presses.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF PUNCHING, SHEARING, BENDING AND FORMING MACHINES
Units and Value (a), 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980(r)	1981(p)
UNITS								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	1,178	1,680	1,790	1,653	1,575	2,387	2,300	2,5[illegible]2
Punching Machines, Fixed Position & Two Axes Positioning Table	D	D	853	767	768	938	822	674
Plate Shearing Machines	2,311	1,312	1,332	1,254	1,318	1,618	1,481	1,356
Bar and Angle, and Rotary Shearing Machines	567	278	179	234	339	275	186	186
Other Power Operated Punching and Shearing Machines	627	415	546	507	551	527	607	767
Manually Operated Punching and Shearing Machines	D	D	384	847	223			
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	718	521	483	450	417	657	503	420
Bending Rolls, Angles, Bars and Shapes (Power)	409	63	1,440	1,548	1,847		231	296
Press Brakes and Folders (Power) (d)	1,653	1,331				(b)	(b)	(b)
Mechanical						588	824	548
Hydraulic						856	1,540	904
Hydro-Mechanical						622		350
Rotary Bending and Forming (Power)	1,925	2,623	2,453	3,523	2,334	1,655	1,275	1,200
Rotary Head and Ram Bending (Power)					1,588	1,487(c)	1,287(c)	1,068(c)
Other Bending and Forming Machines (Power or Manual)	5,784	3,580	4,043	6,275	4,202	3,926	3,582	2,837
VALUE (Millions of Dollars)								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	$20.5	$11.1	$15.7	$15.4	$14.0	$20.8	$21.7	$26.0
Punching Machines, Fixed Position & Two Axes Positioning Table	D	D	44.6	54.2	64.6	81.4	95.1	85.9
Plate Shearing Machines	26.1	41.3	44.1	44.3	46.6	53.6	61.0	65.9
Bar and Angle, and Rotary Shearing Machines	5.6	4.7	3.5	2.4	2.6	3.3	1.6	3.0
Other Power Operated Punching and Shearing Machines	9.4	15.7	8.7	10.1	13.0	15.2	17.4	19.0
Manually Operated Punching and Shearing Machines	D	D	.8	1.8	.6			
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	8.5	9.0	9.7	9.4	9.4	34.1	24.2	27.8
Bending Rolls, Angles, Bars and Shapes (Power)	9.2	2.3	39.6	43.6	52.9		13.1	14.9
Press Brakes and Folders (Power) (d)	29.1	32.5				(b)	(b)	(b)
Mechanical						10.8	15.2	12.5
Hydraulic						30.0	50.8	40.7
Hydro-Mechanical						10.0		9.1
Rotary Bending and Forming (Power)	15.0	24.0	27.2	26.5	19.7	19.3	26.4	23.6
Rotary Head and Ram Bending (Power)					14.9	16.1(c)	14.3(c)	15.4(c)
Other Bending and Forming Machines (Power or Manual)	43.3	41.4	35.9	51.4	42.1	51.0	58.6	55.6

D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Average value $1,000 and over through 1977, $2,500 or over beginning in 1978.
(b) Folders included in Other.
(c) Ram and Press Bending Only, Rotary Head is a part of Rotary Bending and Forming.
(d) The detail for press brakes is not available prior to 1979.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF FORGING AND OTHER METAL FORMING MACHINE TOOLS

Units and Value (a), 1974 to Date

Products	1974	1975	1976	1977	1978	1979	1980(r)	1981(p)
UNITS								
Forging Machines (Except Presses)	690	519	545	494	533	609(b)	631(b)	479(b)
Riveting Machines (Except Portables)	1,884	1,389	2,707	2,969	3,346	3,246	2,025	1,794
Thread Rolling Machinery	257	242	212	203	232	233	202	154
Die Casting Machines								
Under 500 Tons	NA	NA	NA	NA	NA	90	123	113
501 Tons and Over	NA	NA	NA	NA	NA	136	94	58
Spinning Lathes Marking Machines, Knurling Machines	D	D	D	D	D	2,851	2,766	2,261
Metal Container Making Machines Electroforming & Others	4,075	2,513	1,922	2,160	2,568			
VALUE (Millions of Dollars)								
Forging Machines (Except Presses)	$40.1	$39.5	$52.2	$51.1	$59.3	$84.7(b)	$73.8(b)	$76.0(b)
Riveting Machines (Except Portables)	8.0	12.1	13.0	14.6	13.7	15.8	21.9	24.6
Thread Rolling Machinery	5.6	6.4	6.3	7.1	8.3	9.4	8.9	8.7
Die Casting Machines								
Under 500 Tons	NA	NA	NA	NA	NA	7.6	12.4	11.6
501 Tons and Over	NA	NA	NA	NA	NA	30.9	27.1	15.4
Spinning Lathes Marking Machines, Knurling Machines	D	D	D	D	D	75.3	88.0	71.1
Metal Container Making Machines Electroforming & Others	72.2	46.7	49.2	52.3	72.1			

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or over beginning in 1978.

(b) Includes forging presses.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

INDUSTRIES MANUFACTURING MACHINE TOOLS
Value of Shipments, by Industry, by Type, 1972 and 1977
(Millions of Dollars)

	Shipped by							
			Metal Cutting Machine Tool Industry	Metal Forming Machine Tool Industry	Special Dies, Tools, Jigs, & Fixtures Industry	Machine Tool Accessories Industry	Metal Working Machinery N.E.C. Industry	Other Industries
	All Industries		SIC 3541	SIC 3542	SIC 3544	SIC 3545	SIC 3549	
	1972	1977	1977					
Metal Cutting Machine Tools								
Total	$1,259	$2,561	$2,354	$31	$14	$48	$ D	$102
Boring Machines	59	94	90	—	D	D	D	D
Drilling Machines	74	109	103	—	—	D	D	D
Gear Cutting & Finishing	57	67	53	D	—	D	—	D
Grinding & Polishing	169	288	244	D	—	D	D	29
Lathes	198	456	447	D	—	D	D	6
Milling Machines	87	168	150	12	—	—	D	D
Other Machine Tools (a)	303	714	660	(d)	D	10	D	22
Parts Sold Separately (b)	242	502	461	8	D	6	D	20
Not Specified	71	163	146	(c)	8	3	(c)	5
Metal Forming Machine Tools								
Total	$670	$1,115	$35	$967	$ 2	$ 4	$ 4	$103
Punching, Shearing, Bending, and Forming Machines	153	280	5	257	D	D	D	D
Presses, incl. Forging Presses	183	283	D	241	—	D	D	D
Other Metal Forming Tools	149	172	D	140	D	D	D	D
Parts & Rebuilt Machines	162	296	15	244	D	D	2	D
Not Specified	23	85	—	84	—	—	—	(c)

D - Witheld to avoid disclosure. N.E.C. - Not elsewhere classified.

(a) Includes machine tools for home workshops, laboratories, etc.
(b) Includes rebuilt machine tools.
(c) Under $2 million.
(d) Over $2 million.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977; MC77(2)-35C" and earlier issues.

Machine tools are "primary products" of the metal cutting and metal forming machine tool industries (SIC 3541 and 3542). However, other industries also manufacture machine tools as "secondary products". In turn, the machine tool industry produces some products other than machine tools.

MILITARY PRIME CONTRACT AWARDS FOR MACHINE TOOLS
Fiscal Years 1978 to Date
(Thousands of Dollars)

	Year ending June 30			
	1978	1979	1980(r)	1981
Saws and filing machines	$ 1,876	$ 2,212	$ 2,115	$ 2,142
Machining centers and way type machines	1,519	6,793	2,883	4,155
Electrical and ultrasonic erosion machines	7,565	545	499	382
Boring machines	5,248	3,337	6,640	3,414
Broaching machines	23	104	38	839
Drilling machines and tapping machines	3,975	6,671	1,413	1,372
Gear cutting and finishing machines	36	0	40	163
Grinding machines	7,834	5,147	9,969	17,681
Lathes	10,233	9,974	24,032	23,645
Milling machines	6,709	5904	11,252	12,248
Planers and shapers	1,323	966	183	400
Miscel. machine tools	842	146,276	115,512	27,594
Total metal cutting machine tools	$47,185	$187,929	$174,576	$ 94,035
Bending and forming machines	$ 3,986	$ 2,244	$ 3,662	$ 2,524
Hydraulic and pneumatic presses	2,048	1,041	952	2,102
Mechanical presses, power driven	940	381	299	755
Manual presses	312	163	156	430
Punching and shearing machines	2,844	2,448	2,521	4,342
Forging machinery and hammers	2,662	191	214	398
Wire and metal ribbon forming machines	83	843	42	474
Riveting machines	102	129	117	151
Miscel. secondary forming & cutting mach.	479	58,474	32,688	128,578
Total metal forming machine tools	$13,456	$ 65,914	$ 40,651	$139,754
Total Machine Tools	$60,641	$253,843	$215,227	$233,789

r - Revised.

Source: Department of Defense, OASD (Comptroller), "Military Prime Contract Awards, by Service Category and Federal Supply Classification".

5

U. S. MACHINE TOOL FOREIGN TRADE

Machine tool exports are an important factor in the U.S. balance of trade and a very important contributor to the health and stability of the machine tool industry. While domestic new orders have been subject to violent cycles, foreign orders have shown considerably greater stability.

Both exports and imports of machine tools have grown at a much faster rate than domestic shipments. Over the past ten years, U.S. exports have grown from $260 million to over $1.0 billion, an increase of almost 300%. Over this same time period the growth of imports was much more pronounced, growing from $90 million to $1.5 billion. The abrupt surge in U.S. machine tool imports in 1978 created the first balance of trade deficit in the industry's history. The record high demand for machine tools in the U.S. domestic market pushed this trade deficit upward during 1979 and 1980. The recession of 1981 saw a decline in the trade deficit to $455 million from 1980's $513 million. This slight deficit decline was small solace to the industry as the share of the market comprised by import rose to 25.0% for the year, up from 1980's 23.2%.

United States Foreign Trade Statistics

The most widely used data on foreign trade are the Census Bureau reports on exports and imports. Exports and imports are compiled from copies of the shipper's own declaration filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Freight, insurance, and other charges are included, thus giving exports a value higher than that of the machine tool at the manufacturer's plant.

The Census data include shipments by manufacturers and by others such as dealers and distributors. They also include exports of rebuilt machine tools, replacement parts, and machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking.

While the Census export figures tend to show a value higher than the value of the machines at the manufacturer's plant, import figures show values considerably lower than those paid by the purchaser of foreign machine tools. Values are, in general, based on the market value, or price, in the foreign country at the time of exportation and include the cost of containers and coverings as well as other charges and expenses incidental to placing the merchandise into condition for shipment to the United States. However, they exclude import duties, insurance, ocean freight, and other charges incidental to the arrival of the goods in the United States.

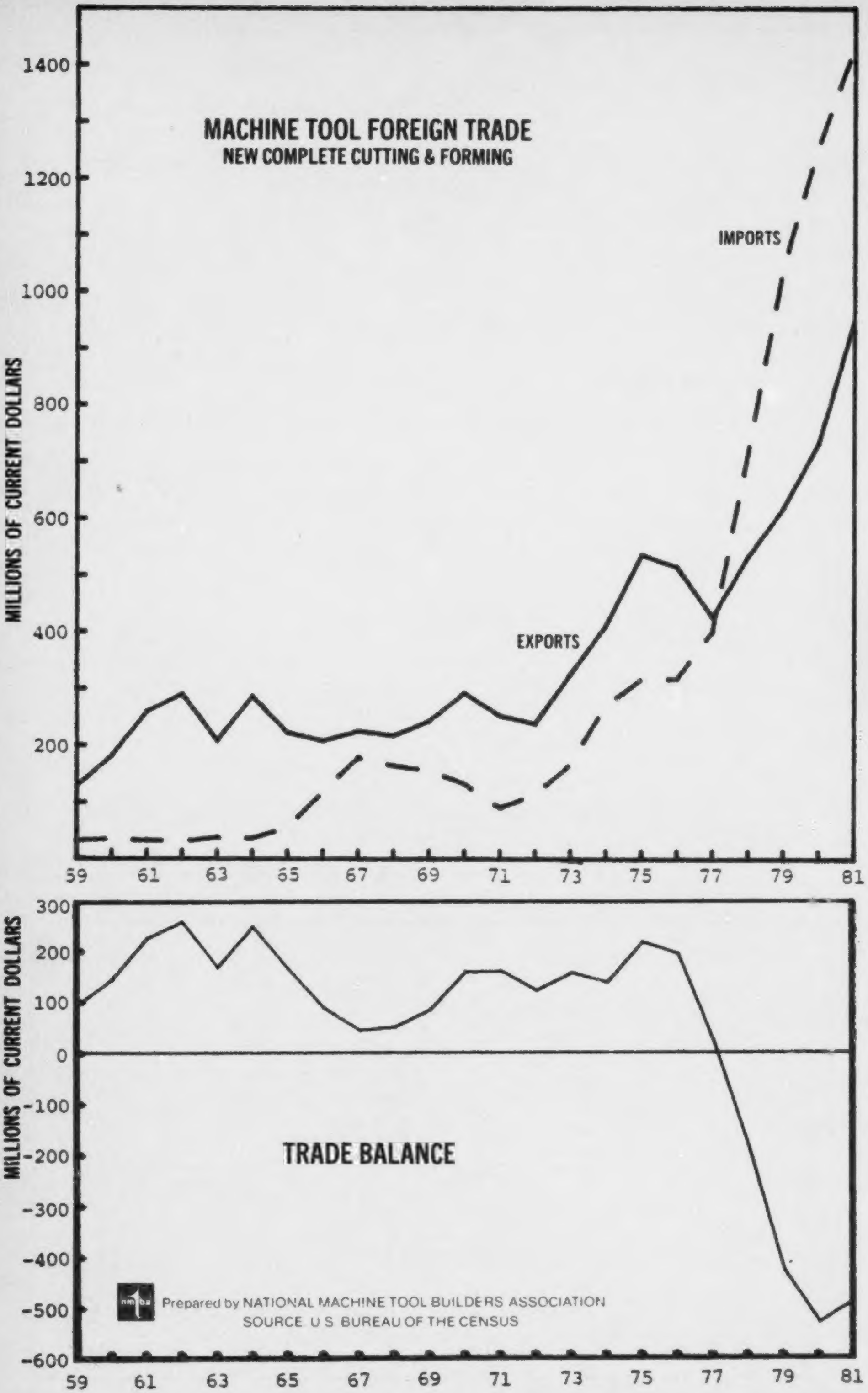
As a result of these and other factors inflating the "value" of the exports and deflating the "value" of the imports, the impact of imports is greater than that shown in most tables in this chapter. The negative balance of trade, correspondingly, is larger than shown.

There are two additional export series with a more limited scope but considered more accurate by the industry.

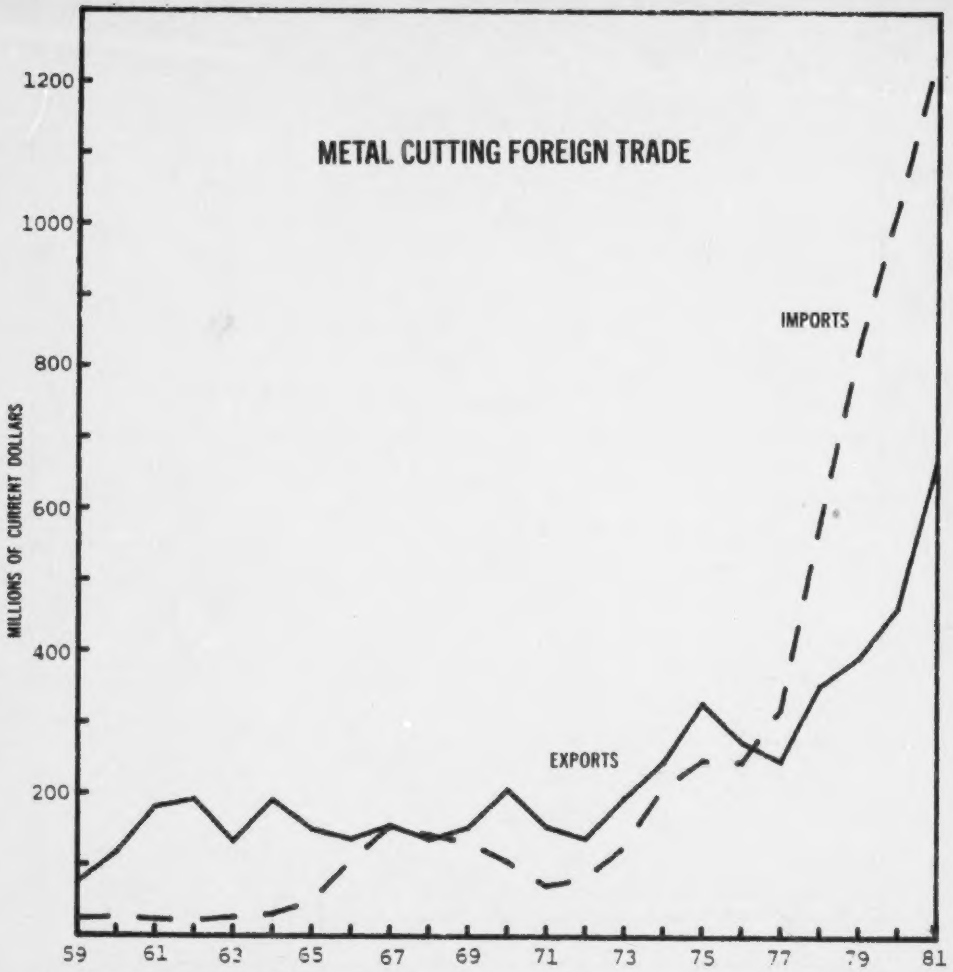
The first is a series on foreign orders and shipments that is part of the NMTBA "Industry Estimates of New Orders, Cancellations, Shipments, and Backlog," published monthly for the entire industry (see Chapter 4 for details on this report).

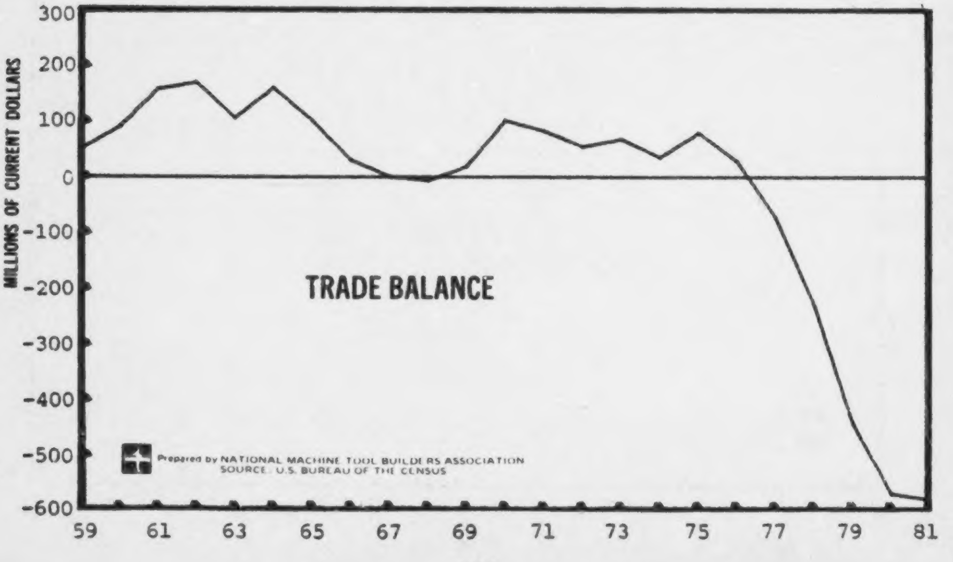
The other is the series on exports, based on manufacturers' shipments for export, published in the MQ-35W series by the Department of Commerce (see Chapter 4 for details). This report shows manufacturers' shipments of new and complete machine tools for 12 major machine tool categories. It also shows the historical quantity and value of exports for about 15 selected types of machine tools through 1972, but only the value of exports from 1973 forward. The two major reasons the Census data are the most widely used in spite of their shortcomings are that (1) the Census series on imports is the only one available, and (2) the two Census series on exports and imports include a similar broad "universe" (new, used, and rebuilt machines and home-workshop type machine tools).

Beginning with 1980 data, the commodity descriptions and classification numbers for machine tools were revised. Although the machine tool categories differ slightly, the resulting TSUSA export and Schedule B import classification codes are comparable and permit direct comparisons of foreign trade by product types. Foreign trade data are also comparable to U.S. production data (MQ-35W, see Chapter 4), permitting the calculation of U.S. consumption of machine tools for a variety of product types.



Prepared by NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
SOURCE U S BUREAU OF THE CENSUS





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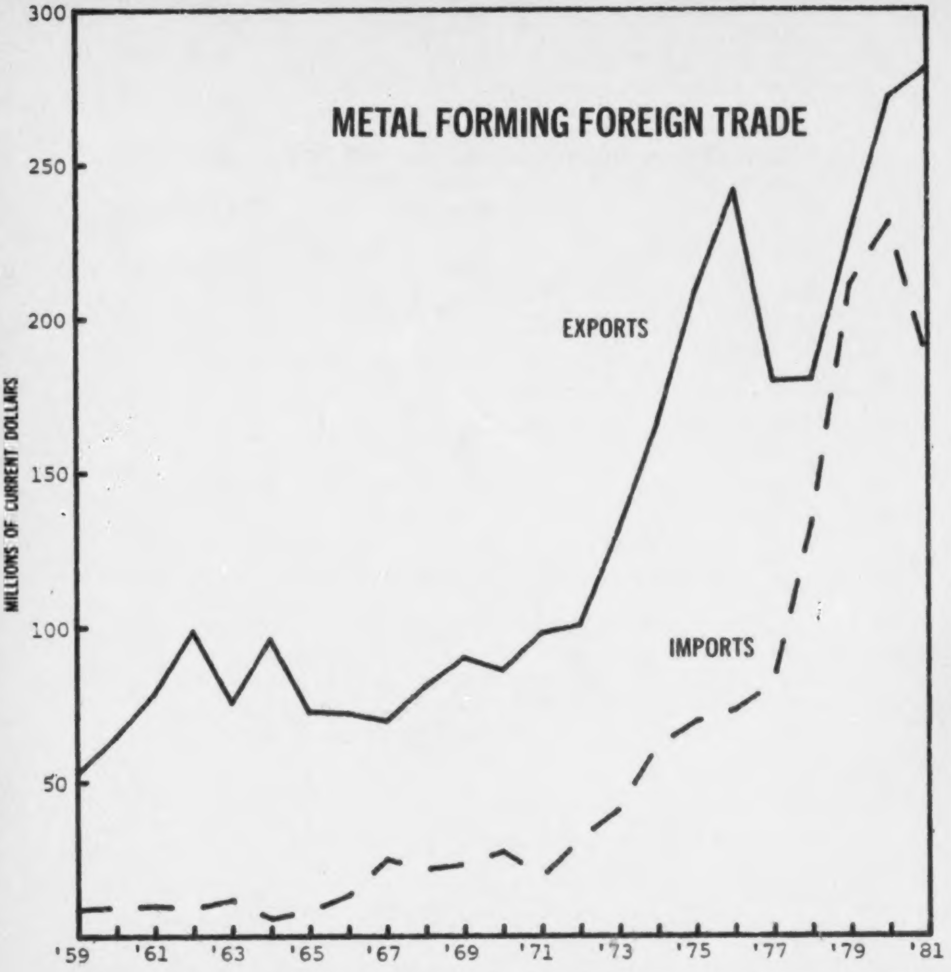
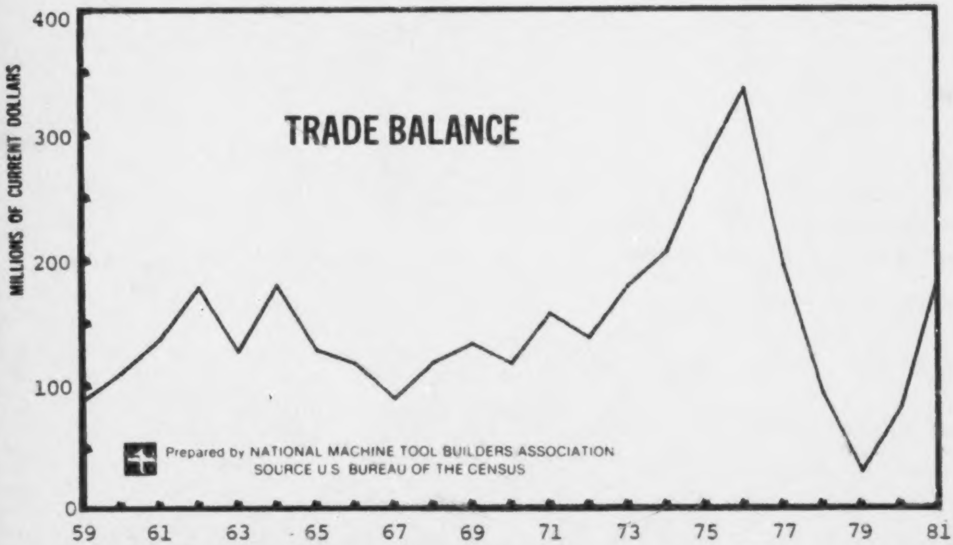




Prepared by NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
SOURCE U S BUREAU OF THE CENSUS

U.S. MACHINE TOOL IMPORTS AS A PERCENTAGE OF U.S. MACHINE TOOL CONSUMPTION

By Types Based on Dollar Value (a), 1973 to Date

	1973	1974	1975	1976	1977	1978	1979	1980	1981
All Machine Tools	9.7%	12.7%	13.8%	14.9%	15.6%	21.3%	22.2%	23.2%	24.2%
Metal Cutting Types	10.7	13.9	14.5	15.6	16.8	23.0	23.2	24.2	25.4
Metal Forming Types	7.5	7.9	11.8	13.0	12.4	16.1	18.7	19.6	17.0
Gear Cutting & Hobbing Types	9.6	16.0	27.2	24.9	NA	NA	NA	NA	NA
Drilling Types	6.2	10.9	10.1	14.2	16.2	11.3	14.6	14.8	19.7
Lathes (excl. Vertical Turret Lathes)	15.0	19.2	17.3	18.6	23.9	31.3	39.5	30.4	55.6
Grinding & Polishing Machines	10.5	14.2	13.2	14.8	14.3	18.6	16.2	24.1	21.2
Milling Machines	11.4	13.5	17.0	18.0	NA	NA	24.3	30.8	23.7
Boring Machines (incl. Vertical Turret Lathes)	14.8	22.3	29.5	26.5	30.7	30.8E	29.6	30.5	31.3

NA - Not Available. E - Estimate.

(a) Based on shipments of complete machine tools with values greater than $2,500, where possible.

Sources: U.S. Dept. of Commerce: "Current Industrial Reports, Series MQ-35W, Metalworking Machinery", and U.S. Bureau of the Census, "IM 146".

UNITED STATES PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF MACHINE TOOLS, 1964 to Date

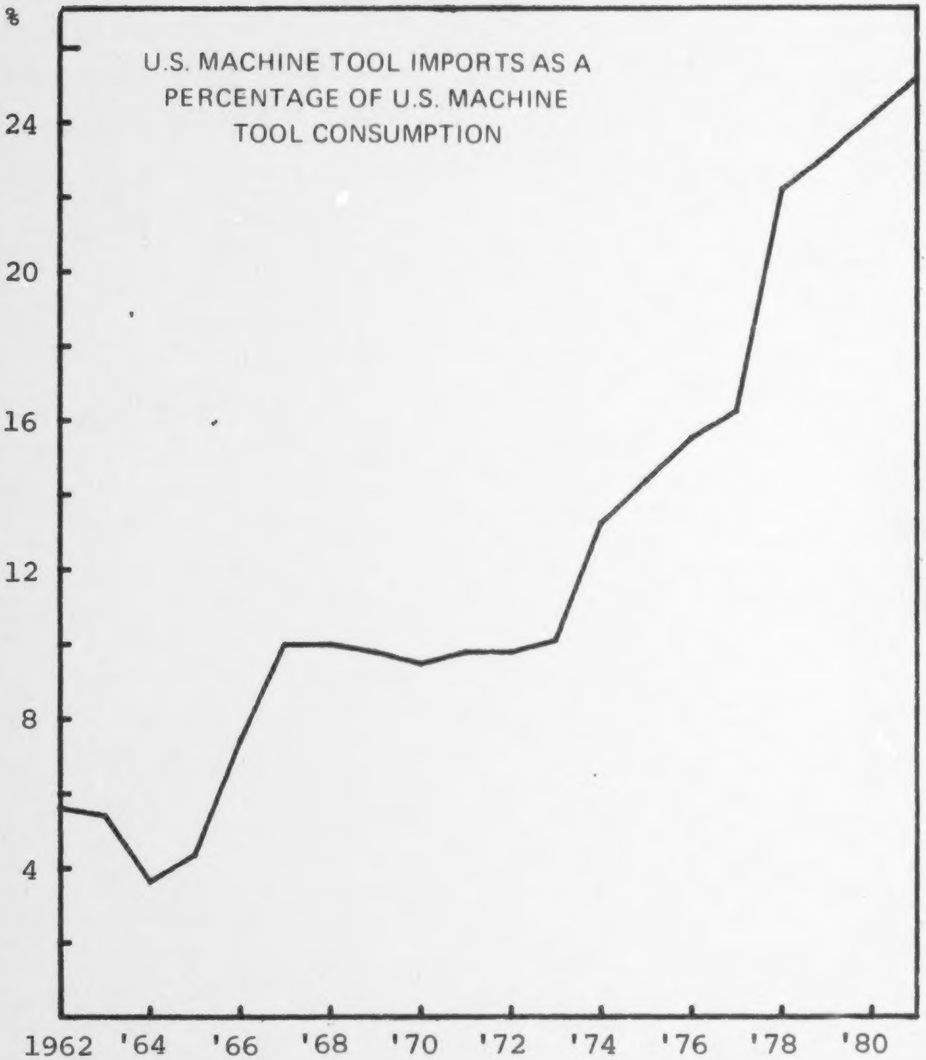
(Millions of Dollars)

Year	Production	Exports	Imports	Domestic Consumption
1964	$1,209.1	$198.6	$ 36.3	$1,046.8
1965	1,457.7	171.3	56.3	1,342.7
1966	1,712.8	173.2	117.8	1,657.4
1967	1,869.3	194.1	178.1	1,853.3
1968	1,722.7	174.5	163.6	1,711.8
1969	1,692.2	181.5	156.1	1,666.8
1970	1,551.8	238.8	131.8	1,444.8
1971	1,057.9	191.0	90.1	957.0
1972	1,269.3	171.1	114.0	1,212.2
1973	1,787.9	224.7	167.1	1,730.3
1974	2,165.9	310.2	270.9	2,126.4
1975	2,406.1	423.6	317.6	2,300.1
1976	2,178.3	352.3	318.3	2,144.3
1977	2,440.7	279.1	400.9	2,562.5
1978	3,004.3	371.0	715.3	3,348.6
1979	4,064.0	395.6	1,043.8	4,722.3
1980	4,812.3	630.8	1,259.8	5,441.4
1981(p)	5,130.9	671.6	1,431.5	5,890.8

p - Preliminary. r - Revised.

Note: Production and export figures are those reported by domestic manufacturers in the MQ-35W. Import figures are taken from the Department of Commerce's "IM146" report and do not include the value of used and rebuilt machines.

Source: NMTBA, "Current Industrial Reports; Metalworking Series, MQ-35W", U.S. Department of Commerce Trade Statistics.



The government import statistics used on this and the previous page represent machine tool values in the originating foreign country. They exclude import duties, freight insurance and other charges incurred in bringing the machines to the United States and thus understate the imports' actual cost. A conservative adjustment reflecting these value-adding charges results in a slightly higher proportion of U.S. consumption being accounted for by imports. For example, the adjusted 1979 import share of U.S. machine tool consumption was 23.3% as compared with an unadjusted share of 22.1%

U.S. IMPORTS OF MACHINE TOOLS

Major Countries of Origin, 1970 to Date

(Millions of Dollars)

Country of Origin	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
TOTAL	$131.8	$90.1	$114.0	$167.1	$270.7	$317.6	$318.3	$400.9	$715.3	$1,043.8	$1,298.5	$1,482.9
Austria	2.9	.7	1.3	.9	1.8	3.2	2.0	1.0	2.3	3.7	2.3	2.1
Belgium	1.8	.8	1.8	1.5	5.3	6.4	3.1	4.9	8.0	12.6	16.7	18.5
Czechoslovakia	1.3	.8	1.8	1.1	2.6	2.8	3.5	2.9	3.9	4.6	5.7	4.7
Denmark	.5	.6	.8	.7	1.4	1.1	1.0	.7	2.5	3.3	3.7	2.9
France	3.7	2.5	3.0	9.9	13.4	16.2	9.5	9.7	17.4	21.4	24.9	26.5
Germany (East)	.4	.1	.3	.3	.3	.6	.8	.7	1.8	1.9	2.0	2.9
Germany (West)	46.7	30.8	39.2	51.6	78.0	96.0	93.3	91.2	154.8	197.0	235.9	192.3
Italy	10.3	7.7	7.6	10.1	16.8	15.5	14.6	15.1	25.4	37.5	44.1	42.9
Netherlands	.9	.8	1.1	1.7	2.4	1.3	1.1	1.9	2.7	5.5	6.1	4.9
Norway	.3	.2	.3	.3	.6	.4	.1	.6	.4	.6	.3	.8
Poland	.9	.1	.5	1.7	5.2	2.2	2.8	7.2	12.8	19.2	15.6	15.8
Spain	3.3	1.4	2.5	4.2	6.8	6.4	6.9	7.7	13.4	20.6	27.1	24.3
Sweden	3.8	3.2	3.0	5.5	8.9	9.9	8.4	11.5	18.3	31.3	29.3	28.3
Switzerland	11.7	10.5	11.8	20.0	29.3	27.0	28.6	35.3	57.6	66.0	81.5	78.4
United Kingdom	20.5	11.4	15.0	21.9	31.0	39.3	32.0	46.1	74.9	96.9	117.3	136.1
Canada	6.0	7.0	7.0	9.5	12.7	15.0	14.9	19.2	27.0	34.2	47.9	44.0
Japan	14.7	9.8	14.7	22.0	47.4	62.6	67.3	105.7	220.6	353.3	492.0	687.5
Taiwan	(a)	.1	.2	.8	2.4	2.7	13.0	22.6	48.8	85.7	93.6	102.4
Other Countries	2.1	1.4	2.0	3.3	4.4	8.8	15.4	16.9	22.5	48.5	52.5	67.6

(a) Less than $50,000; included in "Other Countries."

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.

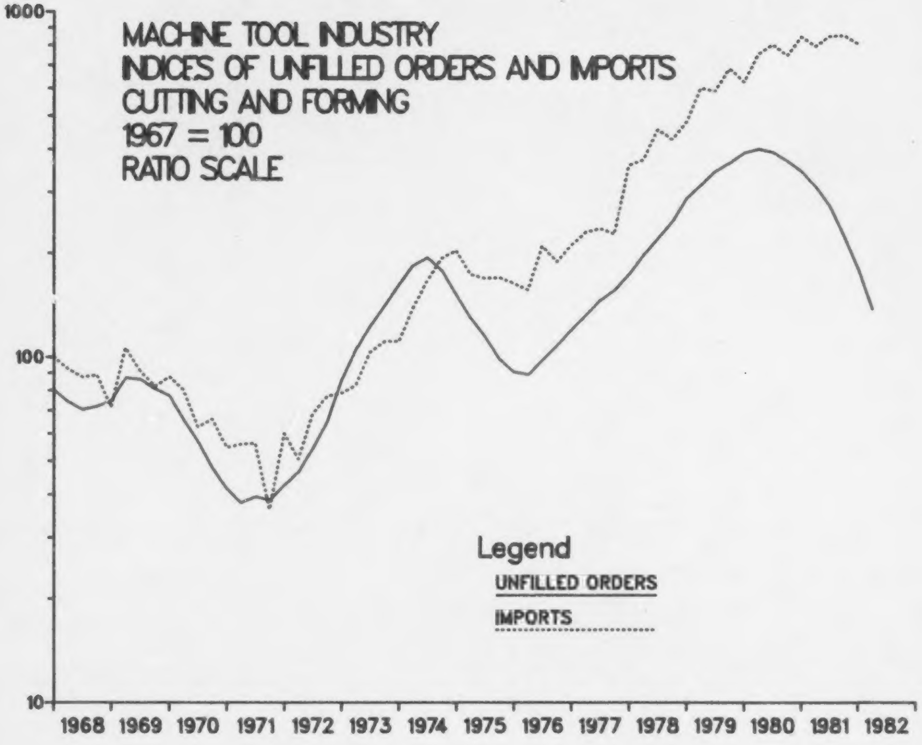
U.S. IMPORTS OF CUTTING AND FORMING MACHINE TOOLS
Major Countries of Origin, 1970 to Date
(Millions of Dollars)

Country of Origin	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
CUTTING TOTAL	$104.7	$70.8	$82.5	$126.0	$209.1	$248.1	$245.3	$319.2	$582.2	$833.1	$1,064.4	$1,291.5
Austria	1.0	.5	.7	.7	1.3	1.6	1.9	1.0	1.8	2.6	1.4	2.0
Belgium	.3	.4	.6	.8	1.7	2.6	1.2	4.3	4.5	6.2	8.0	10.8
Czechoslovakia	1.3	.8	1.8	1.1	2.6	2.8	3.5	2.9	3.9	4.4	5.5	4.6
Denmark	.4	.4	.4	.4	.7	.6	.9	.5	1.8	1.5	2.4	1.3
France	3.3	2.0	2.4	8.7	11.6	14.9	7.8	9.7	13.8	17.5	22.3	20.6
Germany (East)	.4	.1	.3	.3	.3	.6	.7	.7	1.6	1.8	1.9	2.9
Germany (West)	34.9	24.4	23.7	35.3	53.0	69.0	59.7	60.3	104.0	117.0	150.2	148.4
Italy	8.9	5.6	5.9	6.9	11.6	11.3	11.3	11.1	19.6	23.9	34.2	31.6
Netherlands	.8	.8	.9	1.3	1.9	1.0	1.0	1.0	2.4	4.3	5.4	4.3
Poland	.9	.1	.5	1.7	5.0	2.2	2.8	7.2	12.6	19.1	15.5	15.8
Spain	3.3	1.3	2.4	4.0	6.4	6.0	6.2	7.3	13.0	18.9	24.3	21.9
Sweden	2.9	2.6	2.5	4.7	7.8	7.5	7.0	9.6	12.9	21.7	19.9	19.9
Switzerland	9.4	8.1	9.2	14.3	23.1	20.9	22.5	28.1	47.7	53.9	65.9	65.4
United Kingdom	18.1	8.9	11.2	117.1	26.6	34.2	27.8	39.2	64.0	86.7	103.8	120.5
Canada	4.0	4.7	4.6	5.7	7.7	8.5	8.9	11.0	16.2	18.1	29.1	28.2
Japan	13.2	9.0	13.4	19.1	41.0	53.1	54.8	89.1	193.7	305.9	433.4	627.4
Taiwan	(a)	.1	.2	.8	2.4	2.7	12.8	22.5	47.9	85.3	93.1	101.6
Other Countries	1.6	1.1	1.8	3.0	3.9	8.6	14.5	13.7	20.6	44.3	48.1	64.3
FORMING TOTAL	$27.2	$19.2	$31.4	$41.1	$61.6	$69.4	$73.0	$81.7	$133.1	$210.7	$234.1	$191.4
Austria	1.9	.3	.6	.2	.5	1.6	.1	(a)	.5	1.1	.9	.1
Belgium	1.5	.4	1.2	.7	3.6	3.8	1.9	.5	3.5	6.4	8.7	7.7
Germany (West)	11.8	6.5	15.5	16.3	25.0	27.0	33.6	30.9	50.7	80.1	85.7	44.0
France	.4	.5	.7	1.2	1.8	1.4	1.7	2.4	3.6	4.0	2.5	5.9
Italy	1.4	2.0	1.7	3.2	5.2	4.2	3.2	4.0	5.8	13.6	9.9	11.3
Sweden	.9	.6	.6	.8	1.1	2.4	1.4	2.0	5.4	9.6	9.3	8.3
Switzerland	2.3	2.4	2.6	5.7	6.3	6.1	6.2	7.2	9.9	12.1	15.7	13.0
United Kingdom	2.4	2.5	3.7	4.8	4.4	5.1	4.2	6.9	10.9	10.2	[illegible]	15.6
Canada	1.9	2.3	2.4	3.8	5.0	6.5	6.0	8.3	.3	16.1	18.8	15.8
Japan	1.6	.7	1.3	2.9	6.4	9.5	12.5	16.6	26.9	47.4	58.6	60.1
Other Countries	1.1	.9	1.1	1.4	.5	1.8	2.2	2.9	15.6	10.1	10.4	9.6

(a) Less than $50,000; included in "Other Countries".

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.


MACHINE TOOL INDUSTRY
INDICES OF UNFILLED ORDERS AND IMPORTS
CUTTING AND FORMING
1967 = 100
RATIO SCALE
1000
100
10
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
Legend
UNFILLED ORDERS
IMPORTS

UNITED STATES IMPORTS OF MACHINE TOOLS AND PARTS (c)

By Machine Classification, 1970 to Date

(Millions of Dollars)

Machine Classification	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
GRAND TOTAL	$158.5	$109.6	$141.8	$211.6	$330.3	$382.4	$383.3	$482.2	$832.4	$1,269.5	$1,518.2	$1661.4
METAL CUTTING	126.2	87.4	104.3	164.6	261.3	303.0	293.6	386.7	681.6	1,027.6	1,247.0	1439.2
Complete Machines	104.7	70.9	82.5	126.0	209.1	248.1	245.3	319.2	582.2	833.1	1,029.2	1245.6
Gear Cutting or Hobbing	4.5	3.7	4.5	4.7	10.7	20.7	16.9	13.5	25.9	28.4	29.4	37.0
Drilling	4.3	2.9	4.3	5.6	8.8	9.4	15.3	19.6	18.7	25.0	27.2	26.4
Milling	13.5	7.9	7.5	12.4	19.8	23.3	25.9	27.9	47.7	83.1	138.1	124.7
Machining Centers	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	22.0	39.6	93.4	195.7
Boring and Vertical Turret Lathes	22.8	11.6	13.6	14.4	28.8	41.1	41.0	51.8	65.9	70.7	76.9	86.7
Lathes (Exc. Vertical Turret Lathes)	27.9	17.8	22.9	45.7	73.1	77.0	77.0	113.9	219.4	353.6	380.0	479.8
Grinding	15.3	11.6	12.7	20.0	32.4	34.5	32.2	39.2	68.1	85.2	150.5	137.2
Other	16.4	15.5	17.1	23.3	35.5	42.5	37.1	53.3	63.6	82.4	84.4	87.2
Metal Cutting, $2,500 and Under	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	50.9	65.1	50.0	70.9
Parts	21.5	16.5	21.7	38.6	52.2	54.8	48.3	67.5	99.5	194.5	217.8	193.6
METAL FORMING	32.4	22.2	37.6	47.0	68.9	79.4	89.7	95.5	150.7	241.9	271.2	222.2
Complete Machines	27.2	19.2	31.4	41.1	61.6	69.4	73.0	81.7	133.1	210.7	230.5	185.9
Metal Forming, $2,500 and Under	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	4.1	4.5	3.9	4.5
Parts	5.2	3.0	6.1	5.9	7.3	10.0	16.7	13.8	17.6	31.2	40.6	36.3

(a) Included in "Other Metal Cutting Machine Tools".
(b) Included in respective machine classifications.
(c) Does not include "Used or Rebuilt" machine tools.

Note: This table is based on a set of classifications which was expanded in 1978. A separate table on the following page reports import data for 1980 and 1981 using the more detailed machine tool categories.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.

It should be noted that machine tool imports, as reflected in government statistics, are actually undervalued. They reflect values in the country of origin and do not include ocean freight, insurance, dealer commissions or import duties. The purchaser in this country is paying significantly more for imported machine tools than is reported in the import statistics.

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1980 and 1981

(Value in Thousands of Dollars)

Machine Classification	1980		1981	
	Units	Value	Units	Value
GRAND TOTAL	621,945	$1,282,220(a)	940,381	$1,485,105(a)
Complete New Machines	619,326	$1,029,202	935,374	$1,245,556
Gear Hobbers	227	22,971	213	19,366
Gear Shapers	14	779	12	1,846
Gear Cutting Machines, N.E.C.	40	5,672	19	3,942
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	378	30,972	1,127	90,723
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	58	8,414	121	16,825
Horizontal Machining Centers, ATC, NC	229	29,735	381	52,634
Machining Center, NC, N.E.C.	222	24,264	378	35,533
Single Station and Multi-Station Transfer Machines	17	3,725	35	8,259
Way Type Machines (Unit Heads)	33	3,785	2	219
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	19	5,433	20	5,199
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	—	—	—	—
Vertical Boring-Drilling-Milling Machines, NC	31	3,361	23	3,987
Horiz. Boring-Drilling-Milling Machines, non-NC	214	20,038	211	22,017
Vertical Boring-Drilling-Milling Machines, non-NC	1,236	11,086	2,224	18,676
Drilling Machines, NC	13	846	29	2,016
Drilling Machines, Multi-Spindle, non-NC	27	2,934	80	3,923
Drilling Machines, Radial, non-NC	1,477	12,307	1,485	12,095
Drilling Machines, Upright, Single Spindle, non-NC	311	2,001	234	1,439
Drilling Machines, non-NC, N.E.C.	425	9,103	410	6,967
Milling Machines, NC	310	23,396	379	27,406
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	469	11,837	338	6,181
Milling Machines, Knee Type, non-NC	3,436	25,695	4,041	30,975
Milling Machines, Bed Type, non-NC	681	25,604	326	16,841
Milling Machines, non-NC, N.E.C.	6,677	51,599	5,050	43,323
Vertical Boring Machines, incl. VTL's NC	71	6,973	33	5,370
Vertical Boring Machines, incl. VTL's, non-NC	389	12,641	322	10,947
Boring Machines, NC, N.E.C.	23	3,034	16	4,414
Boring Machines, non-NC, N.E.C.	306	14,366	309	16,080
Horizontal Lathes, NC, Less Than 25 HP	1,471	87,679	1,934	122,101
Horizontal Lathes, NC, 25-50 HP	678	55,530	1,307	120,302
Horizontal Lathes, NC, Over 50 HP	133	16,603	267	35,554
Horizontal Engine & Toolroom Lathes, non-NC	8,023	74,164	7,786	74,248
Automatic Chucking Lathes, Single Spindle, non-NC	216	7,526	166	5,773
Automatic Chucking Lathes, Multi-Spindle, non-NC	98	10,151	129	7,791
Automatic Bar Machines, Single Spindle, non-NC	414	9,046	325	8,290
Automatic Bar Machines, Multi-Spindle, non-NC	139	11,807	120	11,141
Horizontal Lathes, non-NC, N.E.C.	1,523	31,172	1,026	27,637
Vertical Lathes, excl. VTL's, NC	378	26,027	270	26,398
Vertical Lathes, excl. VTL's, non-NC	3,637	50,276	2,115	40,523
Gear Tooth Grinding & Finishing Machines	134	11,870	123	11,822
Tool & Cutter Grinding Machines, NC	69	5,230	134	9,029
Tool & Cutter Grinding Machines, non-NC	1,127	22,535	1,236	18,167
Honing & Lapping Machines	212	4,160	180	9,476
Grinding Machines, Flat Surface, NC	56	2,215	42	4,272
Grinding Machines, Flat Surface Reciprocating Table, non-NC	239	5,051	598	11,596
Grinding Machines, Flat Surface, non-NC, N.E.C.	1,935	31,379	1,289	25,570
Grinding & Polishing Machines, NC, N.E.C.	36	2,161	33	3,324
External Grinding Machines, non-NC	659	25,996	619	25,882
Internal Grinding Machines, non-NC	169	8,566	114	4,877
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	202	6,049	201	7,109
Grinding Machines, non-NC, N.E.C.	994	25,244	888	17,853

(Continued)

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1980 and 1981
(Value in Thousands of Dollars)

(Continued)

Machine Classification	1980		1981	
	Units	Value	Units	Value
Traveling Wire Electrical Discharge Machines	80	$5,095	418	$ 18,104
All Other Electrical Discharge Machines	356	15,780	147	7,567
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	214	11,779	130	5,116
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	183	4,400	104	5,313
Metal Cutting Machine Tools, NC, N.E.C.	21	3371	30	2,437
Sawing & Cut-off Machines, non-NC	1,006	13,085	1,232	13,235
Broaching Machines, non-NC	23	2,082	54	4,437
Metal Cutting Machine Tools, non-NC, N.E.C.	764	21,310	749	22,379
Metal Cutting Machine Tools, Less Than $2,500	576,734	50,045	893,490	70,886
Metal Cutting Machine Tools, Used or Rebuilt	2,619	35,218	5,007	45,922
Parts	—	217,800	—	193,627

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146".

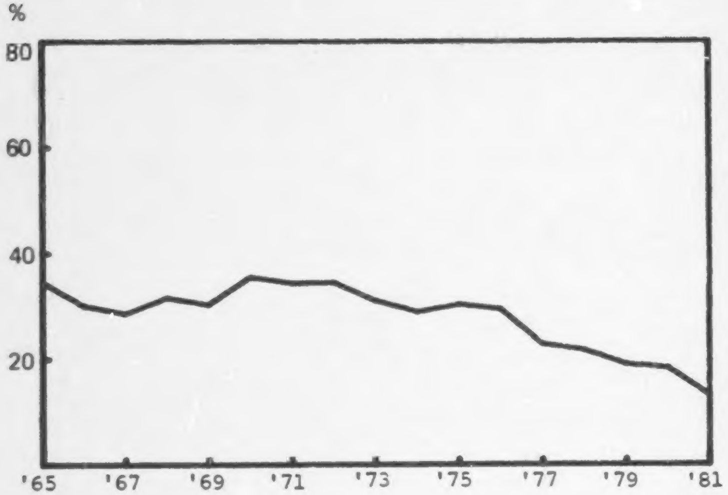
U.S. IMPORTS OF METAL FORMING MACHINE TOOLS AND PARTS
By Machine Classification, 1980 and 1981
(Value in Thousands of Dollars)

Machine Classification	1980		1981	
	Units	Value	Units	Value
GRAND TOTAL	19,774	$274,676(a)	24,213	$227,752(a)
Complete New Machines	19,425	230,600	23,429	185,901
Die Casting Machines	144	6,537	150	4,179
Punching & Shearing Machines, incl. Combination, NC	159	16,452	254	29,835
Shearing Machines, non-NC	682	13,082	720	11,513
Punching & Combination Punching & Shearing Machines, non-NC	592	13,532	669	9,646
Bending, Folding, Straightening & Flattening Machines, NC	60	3,646	40	2,648
Press Brakes, non-NC	260	5,305	432	7,066
Bending Rolls, Ram & Press Bending Machines, non-NC	163	3,878	213	5,085
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	835	20,752	912	15,282
Metal Forming Machine Tools, NC, N.E.C.	23	3,057	17	1,930
Mechanical Presses, non-NC	199	13,625	168	16,164
Hydraulic Presses, Vertical, Single Action, non-NC	85	9,669	79	4,027
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	544	45,149	362	24,140
Headers & Upsetters, non-NC	171	15,756	159	13,941
Forging Machines, non-NC, N.E.C.	75	7,092	37	1,812
Metal Forming Machine Tools, non-NC, N.E.C.	1,429	48,959	938	34,077
Metal Forming Machine Tools, Less Than $2,500	14,004	3,875	18,279	4,514
Metal Forming Machine Tools, Used or Rebuilt	349	3,503	784	5,524
Parts	—	40,573	—	36,327

N.E.C. - Not Elsewhere Classified.

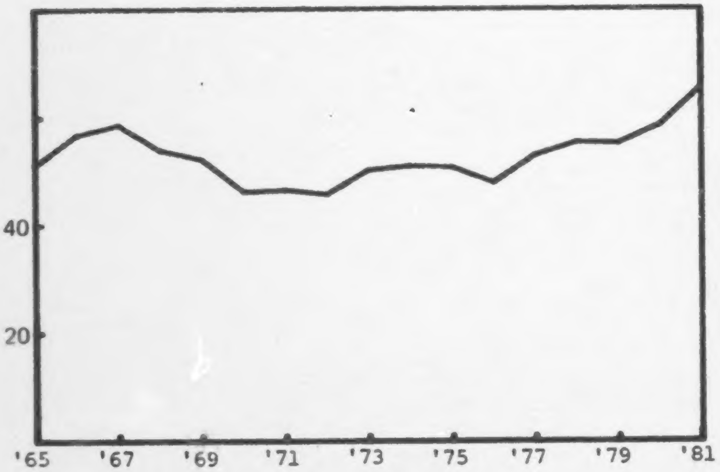
(a) The data may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146".



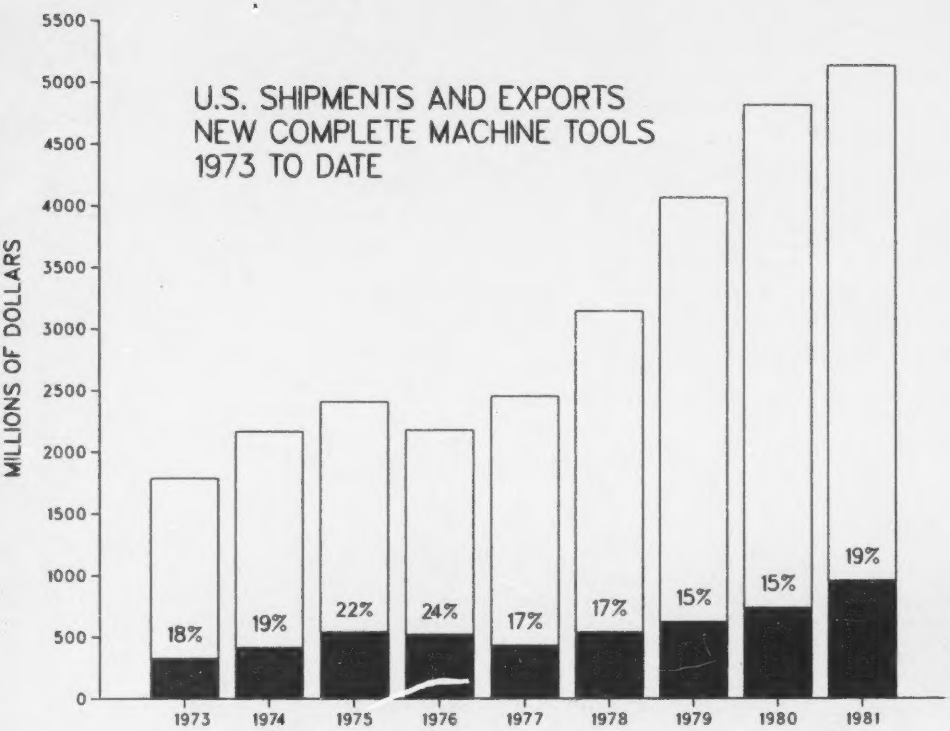
U.S. MACHINE TOOL IMPORTS FROM WEST GERMANY

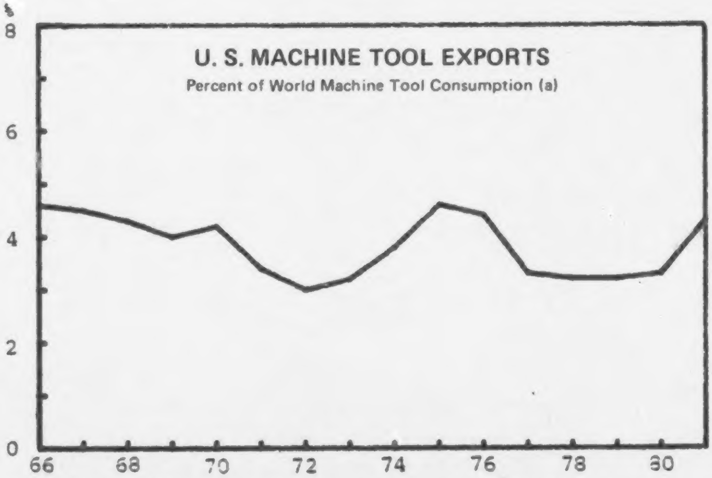
% of Total U.S. Machine Tool Imports



U.S. MACHINE TOOL IMPORTS FROM: UNITED KINGDOM, JAPAN, ITALY, FRANCE, SWITZERLAND

% of Total U.S. Machine Tool Imports





(a) Excludes U.S. consumption of domestically produced machine tools.

Source: American Machinist, U.S. Department of Commerce and NMTBA

U.S. EXPORTS OF MACHINE TOOLS
Cutting and Forming By Destination, 1970 to Date
(Millions of Dollars)

Destination	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
GRAND TOTAL	$305.1	$267.6	$260.0	$350.5	$443.8	$567.6	$546.5	$452.1	$560.2	$648.8	$785.3	$1,027.6
EUROPE	96.6	105.4	96.2	131.0	192.2	242.2	194.1	163.8	201.3	212.3	228.0	231.8
Austria	.6	1.1	1.0	.8	2.0	.5	1.5	1.8	.3	.9	1.8	1.3
Belgium	4.5	3.7	3.1	5.7	7.8	9.8	5.0	7.8	8.7	4.1	3.6	4.9
Denmark	.8	.9	.7	.9	1.1	1.2	2.1	2.5	1.7	3.1	3.1	1.3
Finland	.2	.9	.6	.2	1.1	1.0	2.0	.9	.6	1.9	1.5	1.8
France	12.5	14.9	12.2	16.4	11.9	15.9	18.9	10.8	12.2	20.4	21.3	29.2
Germany, West	15.0	14.9	10.4	12.2	16.9	13.8	16.0	23.7	29.7	28.5	33.7	35.2
Greece	.3	.3	.2	.5	.9	1.7	1.1	.5	1.2	4.5	1.1	1.4
Ireland	.5	1.0	1.0	1.3	1.0	2.1	1.5	1.0	2.0	2.9	3.5	11.4
Italy	19.8	21.4	13.1	12.8	22.9	11.6	13.8	13.5	11.0	17.5	13.4	16.7
Netherlands	2.5	3.0	3.8	4.1	5.2	4.3	3.6	4.5	4.8	5.3	7.8	7.4
Norway	.5	.2	.3	.4	.3	2.9	1.7	4.1	1.5	2.3	1.9	1.0
Poland	.7	.1	1.2	2.7	3.2	7.9	13.5	8.2	24.2	3.1	2.1	(a)
Portugal	.5	.2	.5	.9	.6	.3	.7	.2	.3	.4	.4	2.1
Romania	.5	(a)	.6	.5	.4	1.9	1.6	4.8	21.0	6.6	3.3	1.5
Spain	1.4	3.4	4.9	10.9	6.1	28.2	5.8	4.3	3.7	4.6	13.5	14.2
Sweden	5.0	5.0	3.6	4.7	9.9	9.1	13.2	10.2	6.7	4.0	11.0	5.5
Switzerland	2.1	1.5	1.8	2.3	4.1	4.1	2.8	3.2	4.3	6.2	12.5	9.2
United Kingdom	22.4	17.7	16.6	19.7	27.7	34.8	38.3	26.6	46.4	83.7	62.9	64.1
U.S.S.R.	6.2	13.6	19.9	30.5	68.1	89.1	48.1	31.4	16.7	7.3	25.8	16.5
Yugoslavia	.3	1.2	.5	3.2	.9	1.5	2.2	1.6	3.6	3.6	2.1	4.8
All Other	.1	.1	.1	.3	.2	.5	.2	1.7	.4	1.4	1.7	2.3
NORTH AND CENTRAL AMERICA	96.4	54.4	63.8	82.5	103.9	123.7	136.7	109.4	119.8	167.9	304.4	520.5
Canada	77.7	33.7	43.2	57.3	65.0	76.7	78.9	61.1	76.5	95.4	162.4	256.1
Mexico	16.2	19.2	17.8	22.5	34.9	40.3	52.9	42.0	36.9	67.7	135.7	258.9
All Other	2.3	1.4	2.0	2.3	3.0	5.1	4.1	5.1	5.4	4.8	6.3	5.5
SOUTH AMERICA	17.1	25.8	38.1	58.4	50.5	77.9	116.6	73.8	75.3	89.5	64.5	62.1
Argentina	4.5	4.3	4.1	4.2	3.2	4.0	4.3	3.2	10.8	8.0	13.8	7.7
Brazil	5.4	13.3	25.8	43.6	38.2	55.4	86.5	40.5	31.2	23.8	19.2	24.2
Chile	1.9	.4	.2	.1	.6	.6	1.3	1.1	1.2	2.3	2.3	2.2
Colombia	1.6	1.5	1.4	1.4	.8	2.2	1.3	4.8	3.1	4.1	5.6	4.6
Ecuador	.1	.2	.1	.3	.6	.9	1.5	2.4	2.5	4.0	1.6	3.9
Peru	.3	.6	.6	1.4	.7	2.0	2.1	1.0	.3	1.7	2.2	3.5
Venezuela	3.0	5.2	5.8	7.0	5.9	12.4	19.2	20.2	25.5	45.2	18.9	15.1
All Other	.3	.2	.2	.4	.5	.4	.4	.6	.7	.4	.9	.9

(Continued)

U.S. EXPORTS OF MACHINE TOOLS
Cutting and Forming By Destination, 1970 to Date

(Millions of Dollars)

(Continued)

Destination	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
ASIA	$82.9	$ 70.2	$ 51.8	$67.0	$74.7	$89.8	$79.2	$87.5	$139.3	$151.9	$158.8	$163.6
Taiwan	2.5	1.8	1.9	4.3	3.7	7.6	9.1	17.1	9.6	10.1	15.3	16.2
Hong Kong	.5	.2	.5	.6	.4	.6	.7	1.2	2.3	1.6	4.0	10.2
India	4.3	5.0	2.4	2.3	1.9	3.0	2.5	4.2	6.9	4.4	9.7	15.2
Iran	1.2	.4	.8	1.1	1.2	6.3	12.1	9.7	21.0	1.9	—	(a)
Israel	3.8	4.2	1.9	2.7	3.6	5.8	3.9	3.9	4.1	10.9	12.4	7.7
Japan	62.6	50.1	31.3	40.2	49.1	38.5	27.0	22.1	39.0	48.3	59.1	54.2
Korea, Republic of	1.8	2.0	5.0	8.8	3.6	5.0	5.1	6.8	24.0	34.1	24.3	15.0
Philippines	.4	.9	.7	.6	3.9	6.4	1.8	1.5	1.4	2.6	3.3	3.2
Singapore	2.8	2.1	2.1	2.0	1.9	2.9	3.1	3.9	5.5	6.3	5.5	13.7
Turkey	.6	.9	1.5	.7	1.0	2.7	1.0	.6	4.8	1.5	.4	1.4
All Other	2.4	2.6	3.7	3.8	4.4	11.0	12.9	16.5	20.6	30.2	24.8	26.8
OCEANIA	8.5	6.7	5.2	8.1	12.9	21.5	8.3	7.8	13.7	17.0	12.2	22.7
Australia	8.2	6.3	4.8	7.7	12.1	21.0	7.4	6.6	12.8	15.4	10.7	21.6
New Zealand	.3	.4	.4	.5	.9	.5	.8	1.1	.8	1.6	1.4	.7
All Other	(a)	.1	(a)	(a)	(a)	(a)	.1	.1	.1	(a)	.1	.4
AFRICA	3.6	5.0	4.9	3.6	9.5	12.4	11.6	9.8	10.6	10.2	17.3	26.9
Egypt	(a)	(a)	(a)	(a)	(a)	.1	.4	1.2	1.1	.9	2.5	6.3
South Africa	2.6	3.4	3.1	2.7	7.5	9.1	7.7	4.9	6.4	5.6	11.8	16.9
All Other	1.0	1.6	1.8	.9	2.0	3.2	3.5	3.7	3.2	3.7	3.0	3.7

(a) Less than $50,000 and/or included in "All Other".

Note: These figures represent exports of domestic merchandise; value at U.S. port. The figures are lower than those for total exports because they include used machines but exclude parts. They are higher than manufacturers' export shipments because the latter are priced f.o.b. factory and exclude export shipments made by other than manufacturers.

Individual items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS
By Country of Destination, 1970 to Date
(Millions of Dollars)

Destination	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
GRAND TOTAL	$213.1	$162.9	$148.3	$205.5	$264.3	$343.1	$289.8	$257.7	$366.5	$408.0	$495.4	$724.0
EUROPE	69.5	75.0	63.3	80.6	121.7	161.6	115.4	103.7	143.7	144.7	150.0	153.6
Austria	.6	1.0	.5	.6	1.3	.2	1.2	1.3	.2	.8	1.4	1.2
Belgium	2.1	2.7	1.4	4.1	5.1	5.3	2.8	5.5	5.5	2.2	.8	1.6
Denmark	.4	.3	.3	.5	.4	.6	1.9	1.8	.9	1.3	1.3	.5
Finland	.2	.8	.5	.1	.8	.5	1.3	.1	.6	1.8	1.4	1.3
France	8.9	10.6	7.8	10.0	5.9	8.5	11.7	5.0	7.5	11.1	10.6	19.1
Germany, West	10.0	8.9	5.3	5.9	9.9	8.3	8.8	13.2	18.1	17.3	22.8	27.3
Greece	.2	.2	.1	(a)	.2	.2	.6	.2	.9	1.4	.6	.3
Ireland	.5	.4	.7	.4	.3	.3	.7	.2	1.4	1.1	2.5	3.0
Italy	15.5	14.9	8.3	6.0	16.5	8.9	5.8	9.1	6.6	11.1	9.7	10.1
Netherlands	1.4	1.6	1.8	1.5	1.8	1.9	1.0	2.5	2.9	3.9	5.0	1.5
Norway	.1	.1	.1	.4	.2	2.2	1.5	3.9	1.0	1.8	.9	.7
Poland	.6	.1	1.2	2.3	2.9	4.4	4.5	3.9	19.4	2.7	2.1	(a)
Portugal	.2	.1	.3	.1	.3	.1	.1	.1	.2	.2	.3	1.6
Romania	.5	(a)	.6	.1	.1	.3	1.4	4.8	20.9	1.3	2.3	1.4
Spain	1.0	2.5	2.9	6.1	2.5	19.1	3.6	2.6	2.0	3.3	3.1	8.2
Sweden	3.9	4.6	3.2	3.0	7.9	7.6	11.6	9.1	5.7	3.2	7.5	3.5
Switzerland	1.8	1.2	1.5	2.0	3.1	3.2	2.3	2.4	3.7	5.3	8.9	7.8
United Kingdom	15.2	11.2	8.7	9.4	17.0	21.0	21.6	13.3	27.2	67.4	42.8	46.7
U.S.S.R.	5.9	12.8	17.7	26.2	44.8	67.6	31.8	23.0	15.5	4.6	23.6	15.1
Yugoslavia	.3	.9	.3	1.7	.5	1.1	.8	.7	3.4	2.4	1.1	1.8
All Other	.1	.1	0	.2	.1	.3	(a)	.6	.3	.4	1.3	.9
NORTH AND CENTRAL AMERICA	68.4	28.7	32.1	45.4	57.4	69.0	74.6	60.6	71.1	108.1	205.1	401.8
Canada	58.6	18.4	22.5	31.4	35.8	45.0	39.6	34.7	44.7	60.4	116.2	208.0
Mexico	8.6	9.6	8.5	12.7	19.5	21.3	33.4	23.5	23.0	44.8	86.2	190.8
All Other	1.2	.6	.9	1.1	1.5	2.2	1.5	2.1	2.8	2.9	2.7	3.0
SOUTH AMERICA	8.9	12.6	19.7	38.4	29.3	38.2	47.1	41.9	44.1	37.9	33.0	33.2
Argentina	2.6	2.3	1.5	1.7	2.4	2.6	2.1	2.0	6.6	3.7	6.5	4.3
Brazil	3.6	6.6	15.6	33.4	23.9	29.9	34.9	28.0	25.5	18.5	14.6	14.7
Chile	1.0	.2	.1	.1	.2	.4	1.0	.6	.4	.6	.9	1.3
Colombia	.4	.6	.4	.4	.2	1.0	.3	1.4	1.3	1.4	3.2	2.1
Ecuador	.1	(a)	(a)	.1	.2	.4	.9	.6	1.3	1.3	.7	1.7
Peru	.2	.3	.4	.3	.3	.6	.5	.4	.2	.5	.6	.6
Venezuela	.8	2.5	1.7	2.2	2.0	3.2	7.2	8.6	8.6	11.5	5.9	7.9
All Other	.2	.1	.1	.2	.1	.1	.2	.3	.3	.3	.6	.6

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS

By Country of Destination, 1970 to Date

(Millions of Dollars)

(Continued)

Destination	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
ASIA	$58.8	$40.1	$28.0	$35.2	$43.6	$51.5	$42.1	$43.0	$96.5	$100.6	$90.8	$105.9
Taiwan	1.5	1.1	1.2	1.7	2.2	4.2	4.9	5.0	6.1	6.9	6.5	6.5
Hong Kong	.2	.2	.2	.5	.3	.3	.5	.5	1.8	1.3	.9	1.8
India	3.4	2.7	2.1	1.8	1.2	2.0	1.9	2.3	4.1	3.4	7.0	10.4
Iran	.5	.1	.4	.7	.5	1.8	1.8	3.3	7.2	.3	—	(a)
Israel	2.9	3.3	1.2	1.1	2.1	3.7	2.5	3.1	3.0	6.3	4.3	5.3
Japan	45.1	27.5	17.2	24.4	29.6	23.6	15.6	12.1	30.9	31.1	38.6	40.8
Korea, Rep. of	1.1	1.6	1.3	1.2	1.7	1.8	4.3	5.6	22.1	24.2	16.4	12.7
Philippines	.3	.3	.4	.2	3.2	5.0	1.1	.5	1.0	1.6	1.6	1.9
Singapore	2.0	1.2	1.1	1.3	.8	2.0	1.5	2.2	4.6	5.2	3.8	10.4
Turkey	.5	.6	.5	.4	.3	1.4	.5	.5	4.5	1.5	.3	.9
All Other	1.3	1.4	1.8	1.9	1.6	5.6	7.5	7.9	11.2	18.7	11.4	15.2
OCEANIA	5.6	3.7	2.5	4.5	7.0	15.4	4.8	3.7	6.3	9.8	5.5	15.9
Australia	5.5	3.5	2.3	4.3	6.7	15.2	4.2	3.2	5.8	8.6	4.9	15.3
New Zealand	.1	.1	.2	.1	.3	.2	.6	.5	.4	1.2	.5	.3
All Other	(a)	.1	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	.3
AFRICA	1.8	2.8	2.7	1.5	5.4	7.4	5.8	4.8	4.8	6.9	10.8	13.5
Egypt	(a)	(a)	(a)	(a)	(a)	.1	.2	.6	.4	.7	1.8	3.2
Rep. of South Africa	1.2	1.7	1.2	1.0	4.5	5.6	3.8	3.1	3.4	4.7	7.8	8.5
All Other	.6	1.1	1.5	.5	.2	1.8	1.8	1.1	.9	1.5	1.2	1.8

(a) Less than $50,000 and/or included in "All Other".

Note: Figures include used machine tools but exclude parts.

Individual items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS
By Country of Destination, 1970 to Date
(Millions of Dollars)

Destination	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
GRAND TOTAL	$92.0	$104.7	$111.7	$145.1	$179.5	$224.5	$256.7	$194.4	$193.7	$240.8	$290.0	$303.6
EUROPE	27.1	30.4	32.9	50.3	70.6	80.7	78.7	60.1	57.7	67.6	78.1	78.2
Austria	(a)	.1	.4	.2	.6	.4	.3	.5	.1	.1	.4	.1
Belgium	2.5	1.0	1.7	1.6	2.7	4.5	2.2	2.3	3.2	1.8	2.9	3.2
Denmark	.4	.7	.4	.5	.7	.6	.2	.7	.8	1.8	1.7	.8
Finland	(a)	.1	.1	.1	.3	.5	.8	.7	(a)	.1	.1	.5
France	3.6	4.3	4.5	6.4	6.0	7.4	7.2	5.8	4.7	9.3	10.6	10.0
Germany, West	5.0	6.0	5.1	6.3	7.0	5.5	7.2	10.5	11.6	11.1	10.9	7.9
Greece	.1	.1	.1	.4	.7	1.5	.5	.4	.3	3.1	.6	1.1
Ireland	.1	.6	.3	.9	.7	1.8	.7	.8	.6	1.8	1.1	8.5
Italy	4.2	6.5	4.8	6.8	6.4	2.7	8.0	4.4	4.4	6.4	3.7	6.7
Netherlands	1.1	1.3	2.0	2.6	3.4	2.5	2.6	1.9	1.9	1.5	2.8	5.9
Norway	.3	.2	.2	(a)	.1	.6	.2	.3	.5	.5	1.0	.3
Poland	.1	0	(a)	.3	.3	3.5	9.0	4.3	4.8	.4	(a)	—
Portugal	.3	.1	.2	.8	.3	.2	.6	(a)	.2	.2	.2	.5
Romania	0	(a)	0	.4	.3	1.6	.2	(a)	.1	5.3	1.0	.1
Spain	.5	.9	1.9	4.9	3.6	9.0	2.2	1.7	1.8	1.3	10.4	6.0
Sweden	1.1	.4	.4	1.6	2.0	1.5	1.5	1.1	1.1	.8	3.4	2.0
Switzerland	.3	.3	.4	.3	1.0	.9	.5	.8	.6	.9	3.6	1.4
United Kingdom	7.2	6.5	7.9	10.2	10.7	13.8	16.7	13.4	19.2	16.3	20.2	17.3
U.S.S.R.	.3	.8	2.2	4.4	23.3	21.4	16.3	8.4	1.2	2.7	2.2	1.4
Yugoslavia	(a)	.3	.2	1.5	.4	.4	1.5	.9	.1	1.3	1.0	3.1
All Other	(a)	(a)	.2	.1	0	.2	.2	1.1	.3	1.0	.1	1.4
NORTH AND CENTRAL AMERICA	28.0	25.7	31.7	37.1	46.6	54.7	62.1	48.8	48.7	59.8	99.4	118.8
Canada	19.1	15.2	20.7	26.0	29.2	31.6	39.3	26.4	31.8	34.9	46.2	48.2
Mexico	7.6	9.6	9.3	9.8	15.4	19.1	19.5	18.5	13.9	22.9	49.5	68.1
All Other	1.2	.8	1.1	1.2	1.5	2.9	2.6	3.0	2.6	2.0	3.7	2.5
SOUTH AMERICA	8.2	13.2	18.3	20.0	21.1	39.7	69.5	31.9	31.2	51.7	31.6	28.8
Argentina	1.9	2.0	2.5	2.5	.8	1.4	2.2	1.2	4.3	4.3	7.3	3.4
Brazil	1.8	6.6	10.2	10.2	14.3	25.4	51.6	12.5	5.7	5.3	4.7	9.5
Chile	1.0	.3	.2	(a)	.4	.2	.3	.5	.8	1.7	1.4	.9
Colombia	1.1	1.0	.9	1.0	.6	1.2	1.0	3.4	1.8	2.6	2.4	2.5
Ecuador	(a)	.1	(a)	.2	.4	.5	.6	1.9	1.2	2.6	.9	2.2
Peru	.1	.3	.2	1.0	.4	1.5	1.6	.6	.1	1.2	1.6	2.9
Venezuela	2.2	2.8	4.1	4.8	3.9	9.2	12.0	11.6	16.9	33.7	13.0	7.2
All Other	.1	.2	.1	.2	.3	.3	.2	.2	.4	.3	.3	.2

(Continued)

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Country of Destination, 1970 to Date

(Millions of Dollars)

(Continued)

Destination	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
ASIA	$24.1	$30.2	$23.7	$31.9	$3.1	$38.3	$37.0	$44.5	$42.8	$51.2	$67.9	$57.7
Taiwan	1.0	.7	.7	2.6	1.4	3.4	4.2	12.1	3.5	3.2	8.8	9.7
Hong Kong	.2	.1	.3	.1	.2	.2	.2	.7	.5	.3	3.0	8.4
India	.9	2.2	.3	.5	.7	.9	.5	1.9	2.8	1.0	2.7	4.8
Iran	.7	.3	.4	.4	.7	4.5	10.3	6.4	13.7	1.6	—	(a)
Israel	.9	.9	.7	1.5	1.5	2.0	1.4	.7	1.1	4.6	8.1	2.4
Japan	17.5	22.6	13.6	15.8	19.5	15.0	11.4	9.9	8.1	17.1	20.5	13.4
Korea, Rep. of	.7	.4	3.7	7.6	1.9	3.2	.8	1.3	2.0	9.9	7.9	2.3
Philippines	.1	.6	.3	.5	.7	1.4	.7	1.0	.4	1.0	1.7	1.3
Singapore	.8	.9	1.0	.7	1.1	.9	1.6	1.7	.8	1.1	1.6	3.3
Turkey	.1	.3	.9	.2	.7	1.3	.5	.1	.4	(a)	.1	.5
All Other	1.1	1.5	1.8	2.0	2.6	13.2	5.4	8.7	9.4	11.4	13.5	11.6
OCEANIA	2.8	3.0	2.7	3.6	5.9	6.1	3.6	4.1	7.5	7.2	6.7	6.7
Australia	2.7	2.8	2.6	3.3	5.4	5.7	3.3	3.4	7.1	6.8	5.8	6.2
New Zealand	.2	.3	.2	.3	.5	.4	.2	.5	.3	.4	.8	.4
All Other	(a)	(a)	(a)	(a)	(a)	(a)	.1	.1	.1	(a)	(a)	.1
AFRICA	1.7	2.2	2.3	2.1	4.2	5.0	5.8	5.0	5.8	3.3	6.3	13.4
Egypt	0	(a)	(a)	(a)	(a)	.1	.2	.6	.6	.2	.8	3.1
Rep.of South Africa	1.4	1.7	1.9	1.7	3.0	3.5	3.9	1.8	2.9	.9	4.0	8.3
All Other	.3	.5	.3	.4	1.2	1.4	1.7	2.6	2.3	2.2	1.6	2.0

(a) Less than $50,000 and/or included in "All Other".

Note: Figures include used machine tools for all years but exclude parts.

Indivival items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS (g)

By Machine Classification, 1970 to 1979

(Millions of Dollars)

Machine Classification	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
GRAND TOTAL	$268.7	$210.2	$186.7	$248.8	$320.7	$417.2	$362.7	$321.4	$453.7	$544.9
Complete New Machines	206.2	153.9	137.4	194.6	245.5	327.9	273.8	247.2	353.0	392.5
Machining Centers, N.C.										
Vertical, A.T.C.	(b)	(b)	(b)	(b)	18.4	27.4	35.5	35.9	13.1	14.1
Horizontal, A.T.C.									18.2	28.5
Manual Tool Change									2.2	2.8
Vertical Boring-Drilling-Milling	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	.9	.9
Horizontal Boring-Drilling- Milling	8.8	5.2	5.1	5.8	8.5	8.4	5.8	11.4	9.1	14.4
Vertical Boring and Turning Mills (incl. Vertical Turret Lathes)	3.3	2.4	2.7	2.5	3.3	7.7	8.1	6.6	6.6	10.6
Boring-Drilling-Milling, N.E.C.	6.6	4.0	3.5	1.9	2.4	3.7	2.4	2.2	5.0	6.5
Drilling, Vertical (Upright)	3.9	2.7	2.4	2.4	2.8	6.4	4.9	4.6	2.5	2.0
Multiple Spindle	3.3	3.0	2.7	2.4	1.7	1.8	1.3	1.6	3.3	3.6
Radial	.4	.8	.3	.5	.9	.9	1.6	1.1	1.6	1.3
Other	1.9	2.0	4.1	7.3	7.5	4.7	5.8	7.4	6.4	9.9
Gear Hobbers and Shapers (c)	.7	.9	1.3	.7	.8	1.8	1.6	.4	1.3	2.1
Gear Tooth Grinding & Finishing	9.7	6.1	4.7	8.0	6.5	5.9	7.9	3.8	12.8	4.4
Other Gear Cutting	18.0	22.9	24.0	18.9	21.9	23.7	16.2	23.9	32.9	37.3
External Cylindrical Grinding	13.0	4.8	4.9	8.4	10.8	9.6	11.1	3.7	34.0	13.2
Surface Grinding	8.6	6.7	4.4	7.0	6.8	8.6	10.8	8.3	8.8	11.4
Tool and Cutter Grinding	8.7	5.7	6.9	7.4	7.5	7.9	7.1	7.3	6.8	5.7
Polishing and Buffing	1.3	.9	1.0	2.6	1.7	1.3	1.0	.9	2.7	2.9
Honing and Lapping	4.4	3.0	2.6	5.1	3.4	4.1	7.0	3.3	4.3	3.8
Internal Cylindrical Grinding	6.7	8.8	3.0	6.5	9.6	6.3	6.9	3.7	4.9	5.8
Other Grinding (d)	5.6	7.6	7.4	13.5	13.3	15.2	13.4	12.9	19.3	23.1
Engine Lathes	4.0	3.3	3.1	5.2	3.8	6.8	6.1	4.3	8.3	6.1
Turret Lathes (Excl. Vertical)	3.1	2.5	2.0	2.3	4.5	4.6	9.4	6.7	7.1	7.0
Automatic Chucking Lathes										
Single Spindle	4.1	3.4	2.2	3.8	2.8	9.9	7.6	4.2	7.7	12.4
Multiple Spindle	3.0	5.4	1.7	1.8	5.3	2.8	2.8	4.6	3.4	4.9
Automatic Screw Machines	6.4	7.3	5.1	3.9	6.0	7.4	6.2	5.7	5.2	6.3
Other Lathes	8.6	4.9	7.0	7.3	8.6	12.1	15.3	16.8	11.9	16.3
Milling Machines										
Knee Type	3.3	1.9	3.0	3.1	4.6	4.7	3.2	4.5	4.0	3.4
Bed Type	1.2	2.5	1.7	.5	1.6	1.8	1.7	2.9	11.9	2.8
Profile, Dup. & Die Sinking	3.4	3.4	3.8	2.3	2.9	2.9	3.4	1.0	5.5	4.9
Other	11.1	9.9	5.1	8.1	5.7	11.2	6.0	12.9	9.1	12.3
Broaching	5.1	3.3	1.3	2.5	3.2	5.5	1.8	3.4	11.6	2.4
Planers, Other than Gear	1.7	.3	.3	.4	.3	.5	.6	.7	1.5	1.6
Shapers and Slotters	1.6	.8	.6	.3	1.3	.5	1.0	.6		
Sawing and Cutoff	3.9	4.3	3.9	5.1	6.1	9.0	8.5	7.0	13.5	12.5
Tapping	1.4	.8	1.0	1.3	1.0	1.4	3.4	1.6	1.9	1.9
Threading	2.7	2.0	2.7	4.0	4.9	3.0	2.5	4.5	4.2	9.9
Electrical Discharge	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	3.4	5.2
Single Station (Way Type)									.3	.4
Multi-Station	30.8	5.0	6.4	30.9	39.2	72.0	25.1	7.7	16.0	42.9
Metal Cutting Machine Tools, N.E.C.										
$2,500 and Over, New (e)	5.8	5.4	5.6	11.2	9.8	17.3	11.9	10.8	11.7	14.5
Less than $2,500, New (f)					6.5	9.0	8.9	8.3	17.9	20.5
Used Machines	6.9	9.0	10.9	10.9	18.8	15.2	16.0	10.5	13.5	15.5
Parts (a)	55.6	47.3	38.4	43.3	56.4	74.1	72.9	63.7	87.3	136.9

N.E.C. - Not Elsewhere Classified.

(a) Attachments and accessories are not included after 1971.
(b) Included in "Metal Cutting Machine Tools, N.E.C."
(c) "Gear Hobbers" for years prior to 1978.
(d) "Other Grinding and Polishing" for years prior to 1978.
(e) "$1,000 and Over" for years prior to 1978.
(f) "Less than $1,000" for years prior to 1978.
(g) See footnote (d) on following page.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS (d)
By Machine Classification, 1970 to 1979
(Millions of Dollars)

Machine Classification	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
GRAND TOTAL	$135.1	$140.3	$145.4	$194.3	$245.7	$288.6	$320.0	$258.1	$284.9	$333.7
Complete New Machines	86.0	98.0	100.6	130.9	165.1	208.7	241.1	179.5	180.1	226.6
Punching and Shearing Machines	6.5	5.6	5.9	5.0	9.4	13.8	20.2	15.4	13.7	22.3
Bending and Forming Machines	11.0	12.9	11.9	16.3	21.3	22.9	26.0	25.5	39.2	45.7
Hydraulic and Pneumatic Presses	11.7	14.4	18.1	26.1	27.5	37.5	46.8	29.1	21.5	32.6
Mechanical Presses, O.B.I.	14.2(a)	14.9(a)	15.9(a)	15.6(a)	31.1(a)	28.5(a)	33.2(a)	17.5(a)	2.2	1.1
Other Mechanical Presses									8.6	18.1
Headers and Upsetters	8.3	12.0	11.2	9.2	8.2	8.7	10.6	9.2	14.8	13.2
Forging Machines (except Presses)				4.5	2.7	3.8	3.0	4.2	6.2	7.0
Metal Container-making Machines	3.5	5.8	6.9	11.5	16.7	17.0	23.6	12.0	22.8	32.9
Metal Forming Machines, N.E.C.	4.2	4.3	3.8	5.6	6.1	9.3	6.5	8.1	44.7	46.5
Metalworking Machines, N.E.C.	26.6	28.1	26.9	37.1	39.2	63.6	67.0	54.2		
Metal Forming Mach. Tools under $2,500 (b)	(a)	(a)	(a)	(a)	2.9	3.6	4.2	4.3	6.4	7.2
Used Machines	6.1	7.0	11.0	14.1	14.5	15.8	15.6	14.9	13.6	14.2
Parts (c)	43.1	35.7	33.7	49.2	66.3	64.1	63.3	63.7	91.2	92.9

N.E.C. - Not Elsewhere Classified.

(a) Included in the respective metalforming and metalworking classifications for years prior to 1974.
(b) Under $1,000 for years prior to 1978.
(c) Chucks, chuckholders, tool holders and their parts and work holding, positioning equipment and other attachments and accessories are not included after 1971.
(d) Due to a reclassification by the Bureau of the Census, 1980 data appears on the following pages.

Sources: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1980 and 1981
(Values in Thousands of Dollars)

Machine Classification	1980 Units	1980 Value	1981 Units	1981 Value
GRAND TOTAL	59,393	$674,565(a)	77,022	$974,183(a)
Complete New Machines	52,136	462,775	72,427	668,581
Gear Hobbers and Shapers	96	8,848	233	22,728
Gear Cutting Machines, N.E.C.	314	38,374	357	39,308
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	40	4,561	54	5,506
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	23	4,689	24	5,888
Horizontal Machining Centers, ATC, NC	84	24,286	109	27,029
Machining Centers, NC, N.E.C.	166	23,202	129	14,998
Single Station and Multi-Station Transfer Machines	103	49,530	220	94,197
Way Type Machines (Unit Heads)	17	2,154	19	3,049
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	6	1,665	18	9,504
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	8	3,059	2	631
Vertical Boring-Drilling-Milling Machines, NC	34	3,355	48	4,908
Horiz. Boring-Drilling-Milling Machines, non-NC	7	1,036	21	2,755
Vertical Boring-Drilling-Milling Machines, non-NC	334	4,880	481	37,197
Drilling Machines, NC	22	1,874	27	4,246
Drilling Machines, Multi-Spindle, non-NC	139	11,487	94	7,751
Drilling Machines, Radial, non-NC	45	1,867	63	1,973
Drilling Machines, Upright, Single Spindle, non-NC	24	1,391	95	2,932
Drilling Machines, non-NC, N.E.C.	316	5,599	287	7,481
Milling Machines, NC	26	3,899	45	22,540
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	51	2,867	65	5,532
Milling Machines, Knee Type, non-NC	45	1,055	11	512
Milling Machines, Bed Type, non-NC	25	2,834	18	1,950
Milling Machines, non-NC, N.E.C.	213	8,516	153	7,262
Vertical Boring Machines, incl. VTL's, NC	27	8,169	23	5,319
Vertical Boring Machines, incl. VTL's, non-NC	137	5,466	118	13,396
Boring Machines, NC, N.E.C.	15	580	7	1,027
Boring Machines, non-NC, N.E.C.	58	4,969	79	4,700
Horizontal Lathes, NC, Less Than 25 HP	104	6,223	101	6,973
Horizontal Lathes, NC, 25-50 HP	22	4,336	53	9,508
Horizontal Lathes, NC, Over 50 HP	42	9,971	11	3,871
Horizontal Engine & Toolroom Lathes, non-NC	123	2,967	308	5,571
Automatic Chucking Lathes, Single Spindle, non-NC	76	5,598	47	7,453
Automatic Chucking Lathes, Multi-Spindle, non-NC	36	3,584	35	4,316
Automatic Bar Machines, Single Spindle, non-NC	145	6,022	72	3,208
Automatic Bar Machines, Multi-Spindle, non-NC	58	3,782	84	7,729
Horizontal Lathes, non-NC, N.E.C.	339	10,431	522	18,478
Vertical Lathes, excl. VTL's, NC	15	2,452	25	3,771
Vertical Lathes, excl. VTL's, non-NC	147	11,701	210	19,152
Grinding, Polishing, Honing & Lapping Machines, NC	75	11,611	115	19,466
Gear Tooth Grinding & Finishing Machines, N.E.C.	109	13,984	108	18,097
Tool & Cutter Grinding Machines, non-NC	400	9,240	406	9,548
Honing & Lapping Machines, NC	343	3,913	449	9,526
Grinding Machines, Flat Surface Reciprocating Table, non-NC	123	2,807	205	3,544
Grinding Machines, Flat Surface, non-NC, N.E.C.	171	14,028	338	22,672
External Grinding Machines, non-NC	64	9,331	110	15,894
Internal Grinding Machines, non-NC	40	7,847	36	5,093
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	220	5,152	269	11,240
Grinding Machines, non-NC, N.E.C.	543	21,138	766	29,564

Footnotes are at the end of the Table.

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

(Continued)

Machine Classification	1980		1981	
	Units	Value	Units	Value
Traveling Wire Electrical Discharge Machines	158	$ 1,435	50	$ 1,533
All Other Electrical Discharge Machines	301	8,806	275	3,627
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	8	705	5	494
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	53	921	63	1,430
Metal Cutting Machine Tools, NC, N.E.C.	111	1,560	101	3,488
Sawing & Cut-off Machines, non-NC	908	12,150	755	12,608
Broaching Machines, non-NC	92	6,912	228	15,540
Metal Cutting Machine Tools, non-NC, N.E.C.	1,002	17,914	685	21,672
Metal Cutting Machine Tools, Less Than $2,500	43,933	15,899	63,195	19,049
Metal Cutting Machine Tools, Used or Rebuilt	7,257	32,598	4,595	55,424
Parts	—	179,192	—	250,178

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS
By Machine Classification, 1980 and 1981

(Values in Thousands of Dollars)

Machine Classification	1980		1981	
	Units	Value	Units	Value
GRAND TOTAL	17,978	$424,621(a)	16,467	$471,368(a)
Complete New Machines	16,040	271,360	14,847	280,972
Die Casting Machines & Parts	—	14,428	—	15,204
Press Brakes, non-NC	162	3,525	130	5,695
Metal Forming Machine Tools, non-NC, N.E.C.	1,544	74,420	1,328	67,941
Metal Forming Machine Tools, Less Than $2,500	10,089	7,061	9,717	6,140
Punching & Shearing Machines, incl. Combination, NC	103	13,184	118	13,756
Shearing Machines, non-NC	207	6,015	156	9,174
Punching & Combination Punching & Shearing Mach., non-NC	1,241	25,583	921	22,004
Bending, Folding, Straightening & Flattening Machines, NC	210	12,400	232	14,524
Bending Rolls, Ram & Press Bending Machines, non-NC	112	4,433	57	2,955
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	907	24,119	769	22,820
Mechanical Presses, non-NC	295	27,687	424	22,922
Hydraulic Presses, Vertical, Single Action, non-NC	138	14,944	116	15,008
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	631	27,051	623	41,436
Headers & Upsetters, non-NC	64	4,418	79	7,686
Forging Machines, non-NC, N.E.C.	337	12,012	177	13,636
Metal Forming Machine Tools, Used or Rebuilt	1,938	18,602	1,620	22,596
Parts	—	134,659	—	167,800

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522".

U.S. FOREIGN TRADE IN MACHINE TOOLS AND PARTS

1958 to Date (a)

(Millions of Dollars)

	Exports of Domestic Merchandise (Value at U.S. Port)			Imports for Consumption (Value in Foreign Country)		
Year	TOTAL	Metal Cutting	Metal Forming	TOTAL	Metal Cutting	Metal Forming
1958	$ 148.8	$100.5	$ 48.3	$ 28.1	$ 17.6	$ 10.5
1959	135.0	82.2	52.8	32.5	23.8	8.7
1960	192.5	127.8	64.7	35.7	26.3	9.4
1961	270.2	191.6	78.6	32.4	22.6	9.8
1962	303.9	205.3	98.6	37.5	28.4	9.1
1963	220.6	144.9	75.7	45.1	33.4	11.7
1964	300.8	204.8	96.0	45.6	38.1	7.5
1965	287.2	191.6	95.6	68.9	58.9	10.0
1966	273.6	176.3	97.3	137.4	121.2	16.2
1967	294.5	199.6	94.9	203.7	174.8	28.9
1968	286.0	178.2	107.8	191.3	166.1	25.2
1969	323.5	201.1	122.4	182.6	153.4	29.2
1970	403.9	268.8	135.1	158.5	126.1	32.4
1971	351.0	210.3	140.7	109.6	87.4	22.2
1972	332.1	186.7	145.4	141.8	104.2	37.6
1973	443.0	248.7	194.3	211.6	164.6	47.0
1974	566.5	320.8	245.7	330.3	261.3	69.0
1975	705.9	417.3	288.6	382.4	303.0	79.4
1976	682.7	362.7	320.0	383.3	293.6	89.7
1977	579.5	321.4	258.1	482.2	386.7	95.5
1978	738.6	453.7	284.9	832.4	681.6	150.7
1979	878.6	544.9	333.7	1,269.5	1,027.6	241.9
1980(r)	1,099.2	674.6	424.6	1,556.9	1,282.2	274.7
1981	1,445.6	974.2	471.4	1,712.8	1,485.1	227.7

r - Revised.

(a) Beginning in 1980 "Used and Rebuilt" machine tools are included in Total Exports & Imports.

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metalworking machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Sources: U.S. Bureau of the Census, "EM 522" and "IM 146".

The coverage of exports reported by the Bureau of the Census in its report "EM 522" is more inclusive than that reported as "manufacturers' export shipments." The data include exports by distributors and brokers, rebuilt tools, machine tools designed for workshops, garages, etc. Values include freight, insurance, and other charges from the manufacturers' plants to the point of departure in the United States. Import values exclude import duties, insurance, ocean freight and other charges incidental to the arrival of goods in the United States.

U.S. FOREIGN TRADE IN BORING MACHINES INCLUDING VERTICAL TURRET LATHES
1963 to Date
(Values in Millions of Dollars)

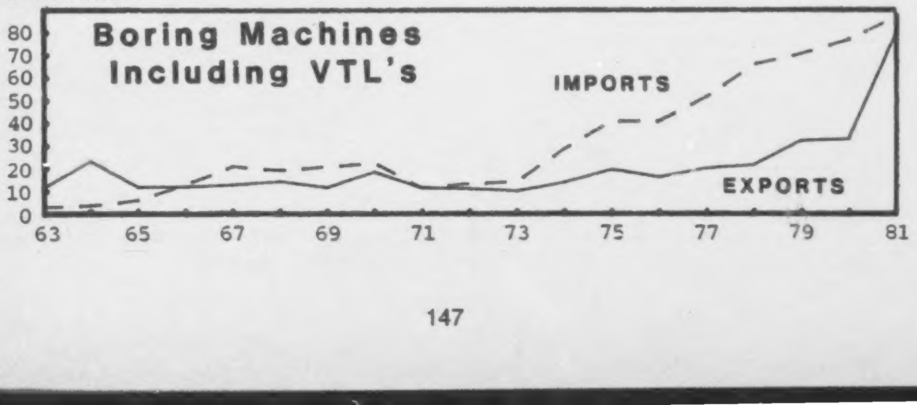
	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)(b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1963	508	$11.4	281	$ 7.7	1,505	$ 3.1
1964	583	23.3	283	8.7	313	3.8
1965	776	11.9	174	4.8	394	6.1
1966	484	12.1	183	5.3	692	12.8
1967	435	13.0	177	4.8	937	21.0
1968	383	14.4	147	4.4	1,057	19.4
1969	363	11.7	121	6.2	797	21.0
1970	503	18.6	158	8.1	2,223	22.8
1971	419	11.5	139	3.8	808	11.6
1972	392	11.2	71	3.0	1,063	13.6
1973	427	10.2	NA	3.7	825	14.4
1974	328	14.1	NA	12.0	1,726	28.8
1975	566	19.7	NA	8.1	2,521	41.1
1976	393	16.3	NA	9.8E	3,219	41.0
1977	382	20.3	NA	6.5	4,824	51.7
1978	577	21.7	NA	10.2	1,347	65.9
1979	724	32.4	NA	9.5	1,901	70.7
1980	626	33.2	NA	17.7	2,289	76.9
1981(p)	797	79.4	NA	41.6	3,158	86.7

NA - Not Available. E - Estimate by NMTBA. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.
(b) Manufacturers' export shipments exclude vertical turret lathes.
(c) Generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".

The user should be aware that the minimum valuation of machines included in each of the three series shown on this and following tables has changed over time. "Total Exports" included all machines, regardless of value, until 1973. From 1974 through 1977 the series included only machines above $1,000. The minimum value was increased in 1978 to $2,500. "Manufacturers' Export Shipments" include machines valued less than $1,000 for all years shown. "Imports for Consumption" included all machines regardless of value through 1977. After 1977 only machines valued over $2,500 are included.



U.S. FOREIGN TRADE IN DRILLING MACHINES

1963 to Date

(Values in Millions of Dollars)

Year	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1963	3,145	$ 6.3	1,183	$ 4.7	1,366	$ 1.0
1964	5,915	13.9	737	7.9	1,255	1.5
1965	7,315	8.6	612	4.2	1,864	2.3
1966	3,425	6.1	494	4.6	3,732	5.1
1967	3,427	10.9	685	7.2	5,304	7.6
1968	1,811	6.8	724	4.7	5,403	10.1
1969	2,413	9.5	1,153	5.6	6,146	6.0
1970	2,316	9.5	1,353	5.5	5,690	4.3
1971	2,173	8.5	672	5.0	4,744	2.9
1972	1,788	9.5	587	4.4	8,223	4.3
1973	2,889	12.6	NA	6.0E	8,541	.6
1974	883	12.9	NA	6.2	11,928	8.8
1975	860	13.9	NA	9.3	11,754	9.4
1976	815	13.6	NA	7.8	50,147(c)	15.3(c)
1977	782	14.6	NA	4.2	72,534(d)	19.7(d)
1978	688	13.8	NA	4.1	1,714	18.7
1979	1,762	16.8	NA	4.2	2,515	25.0
1980(r)	546	22.2	NA	12.2	2,253	27.2
1981(p)	566	24.4	NA	12.1	2,238	26.4

NA - Not Available. E - Estimate by NMTBA. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and ships with the machines; excludes home workshop tools, etc.

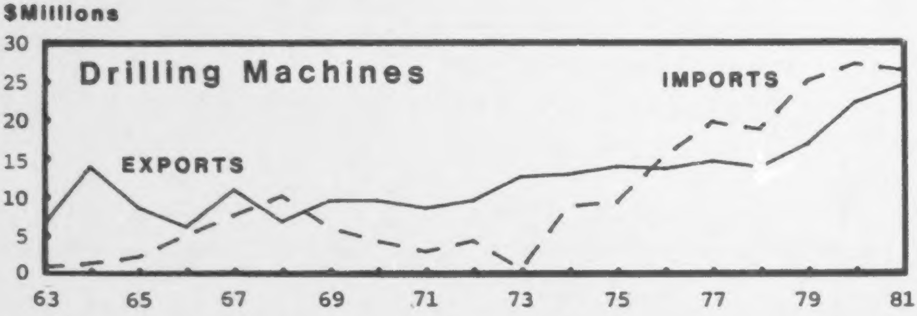
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 6,000 and dollar value about $12,000.

(d) The average unit value of imports from Norway, India, Japan and Taiwan, as reported by the U.S. Bureau of the Census, was extremely low. Evidently these imports include machines which are not by traditional definition machine tools. See chapter introduction for information on revised reporting procedures which have helped rectify this situation.

Note: See note on page 147 concerning description of categories.

Sources: Manufactures' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN GEAR CUTTING AND FINISHING MACHINES
1963 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1963	1,718	$14.4	423	$13.6	NA	$ 1.1
1964	881	18.7	520	17.4	160	1.4
1965	681	16.1	509	18.6	227	3.3
1966	632	15.8	471	18.0	281	2.4
1967	852	23.6	692	29.4	279	3.6
1968	1,266	26.6	647	30.8	297	3.8
1969	841	24.4	615	32.2	320	2.5
1970	780	28.4	636	40.0	226	4.5
1971	1,030	30.0	588	36.4	132	3.7
1972	900	30.0	439	30.7	250	4.5
1973	718	27.5	NA	29.0E	134	4.7
1974	546	29.1	NA	40.0E	343	10.7
1975	499	31.4	NA	35.9	365	20.7
1976	552	25.7	NA	19.7E	198	16.9
1977	303	28.1	NA	D	200	13.5
1978	1,069(c)	47.0(c)	NA	D	494(d)	25.9(d)
1979	684	43.8	NA	D	466	33.1
1980	519	61.2	NA	D	415	41.3
1981(p)	698	80.1	NA	D	367	37.0

NA - Not Available. E - Estimate. D - Withheld to avoid disclosure. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

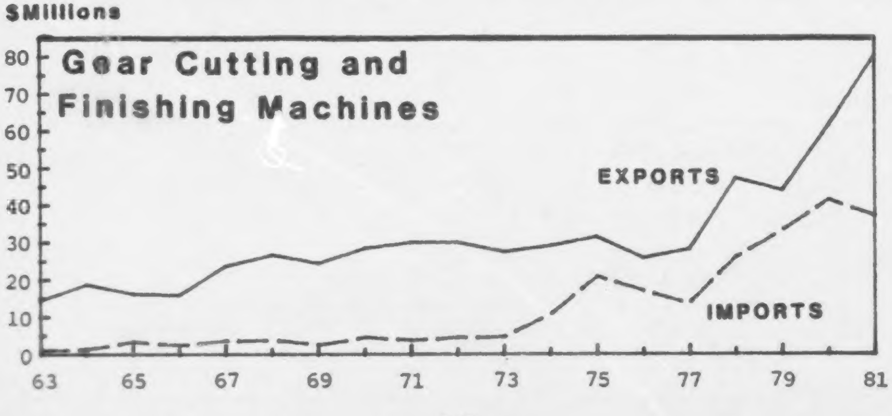
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Includes machines valued at less than $2,500.

(d) Includes used, rebuilt and machines valued less than $2,500 each.

Note: Imports exclude the value of parts. See note page 147 concerning description of categories.

Sources: Manufacturers export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN GRINDING AND POLISHING MACHINES

1963 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1963	12,135	$ 37.3	4,330	$30.2	2,943	$ 4.2
1964	13,152	45.2	3,730	38.1	2,413	4.9
1965	8,607	37.4	3,575	31.1	2,817	6.5
1966	7,093	34.6	4,779	30.4	4,966	12.7
1967	7,128	32.0	4,155	29.7	4,934	16.0
1968	7,679	28.9	3,354	27.7	5,792	17.0
1969	7,906	41.5	3,396	37.0	5,352	16.6
1970	9,154	46.4	4,190	47.0	5,425	15.3
1971	8,094	32.7	3,677	29.4	3,175	11.6
1972	8,900	30.2	3,591	26.8	4,791	12.7
1973	9,883	50.5	NA	39.4	3,972	20.0
1974	3,266	53.0	NA	53.5	7,500	32.4
1975	3,022	53.0	NA	49.5	5,641	34.1
1976	2,537	57.3	NA	56.3	35,411(c)	32.2(c)
1977	4,124	40.1	NA	38.3	46,573(d)	39.2(d)
1978	2,455	80.8	NA	49.8	3,261	68.1
1979	2,487	65.9	NA	42.0	4,233	80.5
1980(r)	1,979	85.1	NA	75.4	5,698	138.6
1981(p)	2,694	126.5	NA	88.1	5,334	137.2

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

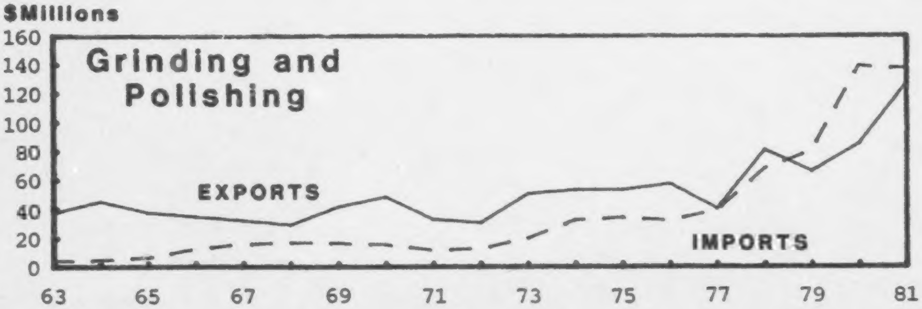
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 11,500 and the dollar value about $31,000.

(d) The average unit value of imports from Taiwan, as reported by the U.S. Bureau of the Census was extremely low. Evidently these imports include machines which are not by traditional definition machine tools. See chapter introduction for information on revised reporting procedures which have helped rectify this situation.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN LATHES, EXCLUDING VERTICAL TURRET LATHES

1963 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1963	3,569	$26.1	2,139	$21.2	4,780	$ 8.8
1964	3,299	36.8	1,633	28.2	6,083	8.9
1965	4,072	23.5	1,322	20.1	8,736	14.2
1966	2,740	19.8	1,131	18.6	14,819	37.2
1967	2,611	21.6	1,083	18.7	15,654	47.7
1968	2,161	18.8	683	15.3	11,452	38.1
1969	2,213	22.2	673	16.8	13,241	38.0
1970	2,871	29.2	842	29.3	12,082	27.9
1971	2,481	26.8	774	24.0	6,252	17.8
1972	2,957	21.1	500	19.2	5,578	22.9
1973	3,124	24.3	NA	20.3E	6,058	45.7
1974	1,921	31.0	NA	31.9E	8,187	73.1
1975	2,503	43.6	NA	55.0	6,745	77.0
1976	2,153	47.4	NA	45.9	7,801	77.0
1977	1,953	42.3	NA	35.6	11,527	113.0
1978	1,434	43.7	NA	37.1	12,280	219.3
1979	1,717	53.0	NA	45.5	18,332	353.6
1980	1,107	67.1	NA	50.8	16,710	380.0
1981(p)	1,468	90.0	NA	57.6	15,445	479.8

NA - Not Available. E - Estimate by NMTBA. r - Revised. p - Preliminary.

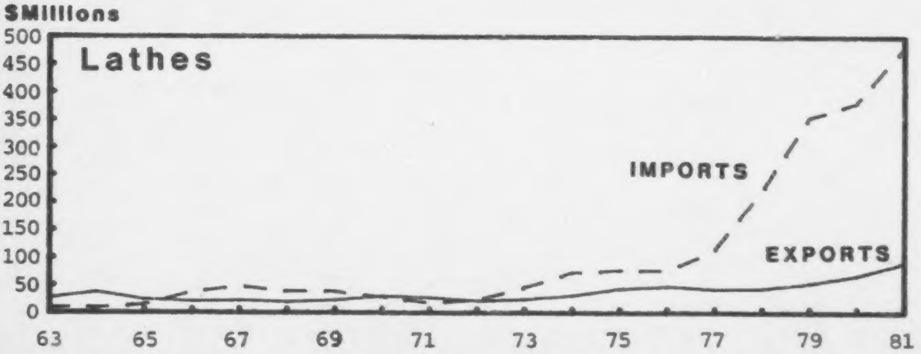
(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Manufacturers' export shipments include vertical turret lathes.

(c) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN MILLING MACHINES
1963 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1963	1,200	$11.4	416	$8.0	498	$ 2.2
1964	1,309	18.1	507	14.8	656	3.3
1965	988	7.5	398	8.8	1,128	6.1
1966	1,072	8.9	338	10.2	3,405	17.4
1967	802	11.3	399	16.8	5,715	31.4
1968	848	17.9	304	12.1	5,428	30.6
1969	686	13.6	368	6.7	4,710	26.3
1970	779	19.1	456	12.2	2,047	13.4
1971	681	17.6	276	11.8	986	7.9
1972	589	13.6	416	5.3	1,441	7.5
1973	687	14.0	NA	8.0E	1,760	12.4
1974	776	14.8	NA	10.3	2,313	19.8
1975	804	20.6	NA	20.6	2,567	23.3
1976	799	14.4	NA	16.3E	2,413	25.9
1977	965	21.3	NA	D	3,720	27.9
1978	1,026	30.6	NA	D	3,364	47.7
1979	1,040	23.4	NA	20.1	6,650	83.1
1980	360	19.2	NA	27.9	11,573	138.1
1981(p)	292	37.8	NA	33.4	10,434	124.7

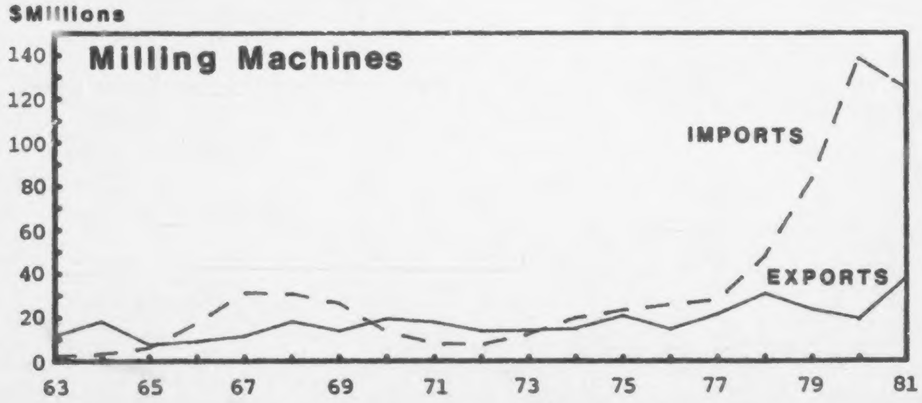
NA - Not Available. D - Withheld to avoid disclosure. E - Estimate by NMTBA. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN MACHINING CENTERS
1979 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1979(c)	259	$45.4	NA	D	552	$ 39.6
1980(r)	313	56.7	NA	$57.9	957	93.4
1981	316	53.4	NA	41.9	2,007	195.7

NA - Not Available. D - Withheld to avoid disclosure. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Data not available prior to 1979, Machining Centers had been included in "Other" category.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; Bureau of the Census, "EM 522" and "IM 146".

U.S. FOREIGN TRADE IN "OTHER" METAL CUTTING MACHINE TOOLS (c)

1962 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1962	5,704	$ 32.4	2,667	$ 31.8	5,669	$ 4.4
1963	9,636	25.4	3,382	16.7	4,849	5.6
1964	8,487	34.6	3,167	36.3	5,965	6.7
1965	9,300	44.8	2,547	39.5	8,434	9.7
1966	10,692	38.5	4,029	39.5	26,340	17.1
1967	9,324	42.7	2,846	37.4	20,533	26.1
1968	11,635	22.3	2,250	26.2	13,550	23.1
1969	9,869	29.5	3,080	30.7	10,832	22.4
1970	11,777	53.0	3,464	43.7	18,509	16.4
1971	10,550	21.9	2,728	22.8	20,167	15.5
1972	9,201	21.8	3,073	23.2	20,704	17.1
1973	14,554	55.5	NA	63.8	9,251	23.3
1974	27,309	90.6	NA	78.0	26,444	35.5
1975	52,902	145.7	NA	146.7	21,266	42.5
1976	98,545	99.1	NA	90.7	42,064	37.1
1977	91,551	80.6	NA	66.4	74,175	53.3
1978	107,823	115.5	NA	92.0	465,218	136.5
1979	105,962	111.7	NA	74.0	597,946	147.5
1980(d,r)	53,943	150.6	NA	173.2	582,050	169.7
1981(p)	70,191	232.1	NA	168.7	901,398	204.5

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) For 1978 and prior years Machining Centers were included in "Other". For 1979 Machining Centers are classified separately.

(d) Beginning in 1980 "Used and Rebuilt" machine tools are included in Total Exports and Imports.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".

U.S. FOREIGN TRADE IN METAL FORMING MACHINES AND PARTS
1963 to Date
(Millions of Dollars)

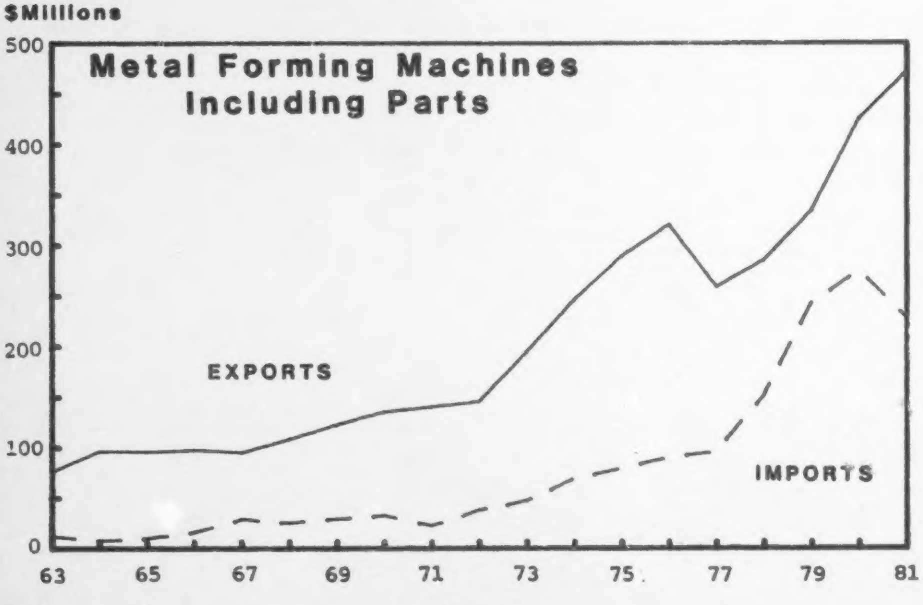
	Exports of Domestic Merchandise (Value at U.S. Port)								Imports for Consumption
Year	Total	Presses	Bending and Forming	Punching and Shearing	Forging Machines	Other New	Used	Parts	Customs Import Value (a)
1963	$ 75.7	$29.7	$ 6.9	$ 7.5	$ 7.0	$22.6*	NA	NA	$ 11.7
1964	96.0	33.6	11.4	5.5	13.4	32.1*	NA	NA	7.5
1965	95.6	26.1	10.1	5.6	10.7	20.2	$ 8.6	$ 14.3	10.0
1966	97.3	22.5	11.2	9.8	6.0	22.6	4.9	20.3	16.2
1967	94.9	22.5	13.6	6.4	6.6	20.5	5.0	20.3	28.9
1968	107.8	33.9	10.2	5.9	5.5	25.4	3.6	23.3	25.2
1969	122.4	28.3	14.1	9.5	6.9	31.2	4.4	28.0	29.2
1970	135.1	25.9	11.0	6.5	8.3	34.2	6.1	43.1	32.4
1971	140.3	29.0	12.9	5.6	12.0	38.2	7.0	35.7	22.2
1972	145.4	34.0	11.9	5.9	11.2	37.6	11.0	33.7	37.6
1973	194.3	41.7	16.3	5.0	13.7	54.2	14.1	49.2	47.0
1974	245.7	58.6	21.3	9.4	10.8	64.9	14.5	66.3	69.0
1975	288.6	66.0	22.9	13.8	12.5	93.5	15.8	64.1	79.4
1976	320.0	80.1	26.0	20.2	13.5	101.3	15.6	63.3	89.7
1977	258.2	46.6	25.6	15.4	13.4	78.5	14.9	63.8	95.5
1978	284.9	32.3	39.2	13.7	21.0	73.9	13.6	91.2	150.7
1979	333.7	51.8	45.7	22.3	7.0	99.8	14.2	92.9	241.9
1980	424.7	69.7	44.5	44.8	16.4	95.9	18.6	134.7	274.7
1981	471.4	79.4	46.0	44.9	21.3	89.3	22.6	167.8	227.8

NA - Not Available. * - Includes Parts.

(a) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Note: See note on page 147 concerning description of categories.

Source: U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. MANUFACTURERS' EXPORT SHIPMENTS OF NEW MACHINE TOOLS (a)

Units and Value, 1959 to Date

(Values in Millions of Dollars)

Year	Total (b)		Metal Cutting		Metal Forming (b)	
	Units	Value	Units	Value	Units	Value
1959	9,867	$ 80.8	7,701	$ 49.5	2,166	$ 31.3
1960	13,203	157.5	10,487	110.2	2,716	47.3
1961	14,080	207.2	11,322	152.0	2,758	55.2
1962	14,520	216.1	11,494	156.5	3,026	59.6
1963	15,109	144.4	12,154	102.1	2,955	42.3
1964	14,110	198.6	10,577	151.4	3,533	47.2
1965	12,475	171.3	9,137	127.1	3,338	44.1
1966	14,634	173.2	11,425	126.7	3,209	46.5
1967	12,861	194.1	10,037	143.9	2,824	50.2
1968	11,462	174.5	8,109	121.2	3,353	53.3
1969	13,083	181.5	9,406	135.2	3,677	46.3
1970	15,061	238.8	11,099	185.8	3,962	52.9
1971	13,634	191.0	8,854	133.2	4,780	57.7
1972	12,093	171.1	8,677	112.6	3,416	58.5
1973	NA	224.7	NA	170.2	NA	54.5
1974	NA	310.2	NA	231.8	NA	78.4
1975	NA	423.6	NA	325.0	NA	98.6
1976	NA	352.3	NA	246.5	NA	105.8
1977	NA	279.1	NA	207.5	NA	71.7
1978	NA	371.0	NA	258.2	NA	112.8
1979	NA	395.6	NA	283.5	NA	112.0
1980(r)	NA	630.8	NA	482.3	NA	148.5
1981(p)	NA	671.6	NA	516.2	NA	155.4

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete machines as shipped, including accessories, etc., ordered and shipped with the machinery at manufacturers' selling price, f.o.b, factory. Excludes rebuilt machines, machines designed primarily for home workshops, laboratories, garages, etc., and parts.

(b) Includes some metalworking type machines other than machine tools prior to 1973.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

Note: Individual items may not add to totals due to rounding.

The export figures for machine tools shown in this table and in tables and graphs in Chapter 4 are substantially lower than those on the preceding pages. This is so for several reasons: first, the data for Manufacturers' Exports cover only new and complete machine tools; second, they represent the manufacturer's selling price at the factory (F.O.B.); third, they exclude machine tools which are sold domestically but exported later by the buyer. The two sources for the tables mentioned above, NMTBA (Chapter 4) and the "Current Industrial Reports" (above), differ although they are based on the same sources. The reasons are the extent of coverage and different reporting practices. See Chapter 4 Introduction for a detailed explanation.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF SELECTED MACHINE TOOLS

Units, 1967 to 1972

Machine Classification	1967	1968	1969	1970	1971	1972
METAL CUTTING						
Boring						
Vertical Boring and Turning Mills, Standard Type	NA	NA	NA	NA	NA	NA
Precision Boring	34	18	24	50	33	D
Gear Cutting						
Gear Hobbers	39	239	221	13	223	D
Gear Tooth Finishing	253			246		
Grinding						
External Cylindrical						
Plain	29	10	141	36	116	117
Roll and Centerless	47	110		54		
All Other	109			100		
Surface Grinding	237	188	263	281	204	D
Special Tool & Cutter Grinding	142	217	592	234	166	171
Honing	24	299		387	348	D
Lathes						
Manufacturing and Tool Room (Up to 36")	289	126	118	105	135	76
Automatic Chucking						
Single Spindle	69	69	28	34	22	31
Multiple Spindle	47		38	81	75	31
Screw (bar) Machines	130	98	119	155	122	110
Milling						
Profile and Duplicator	83	26	17	24	21	18
Broaching	14(b)	D	D	36	12	9
Sawing and Cut-off Machines	NA	NA	NA	NA	NA	234
Transfer	127	64	54	62	44	83
METAL FORMING						
Power Shearing	97	60	68	87	38	65
Bending and Forming, Power						
Bending Rolls, Sheet & Plate	25	29	38	19	58	94
Bending Brakes and Folders	144	107	96	62		
Other	108	NA	NA	NA	NA	NA
Mechanical Presses						
Vertical Straight-sided and Arch Frame (Excl. Knuckle Joint)						
Single Action, Single Point, 201 Tons and Over	12	12	25	4	21	15
Single Action, Two Point 500 Tons and Under	30	22		24		
Hydraulic and Pneumatic Extrusion Presses	5	7	12	8	5	D

NA - Not Available. D - Withheld to avoid disclosing figures for individual companies.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery".

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF SELECTED MACHINE TOOLS

1970 to 1978

(Values in Thousands of Dollars)

Machine Classification	1970	1971	1972	1973	1974	1975	1976	1977	1978
METAL CUTTING									
Boring									
Vertical Boring and Turning Mills, Standard Type	NA	NA	NA	NA	NA	NA	NA	NA	NA
Precision Boring	$ 1,918	$2,089	D	$ 1,036	$ 5,565	$ 4,755	$ 1,973	$ 644	$ 1,260
Gear Cutting									
Gear Hobbers	431	8,749	D	10,988	9,914	9,802	5,076	6,808	9,501
Gear Tooth Finishing	9,176								
Grinding									
External Cylindrical									
Plain	2,816	7,688	$8,535	8,394	15,046		2,710	14,786	2,844
Roll and Centerless	3,416					17,796	19,665		12,205
All Other	10,064								
Surface Grinding	5,175	2,280	D	5,422	5,235	7,426	5,096	6,801	7,829
Special Tool & Cutter Grinding	2,553	2,854	1,996	920	D	3,897	5,897	15,779	4,856
Honing	1,694	1,015	D	1,559	2,077				
Lathes									
Manufacturing and Tool Room (Up to 36")	1,089	1,900	1,789	1,959	4,111	4,985	5,430	3,143	2,010
Automatic Chucking									
Single Spindle	1,487	1,558	1,660	1,518	2,742	8,514	5,744	4,817	10,181
Multiple Spindle	9,502	7,159	3,173	5,229	4,203	4,882	5,493	3,193	
Screw (bar) Machines	7,165	6,637	6,194	6,693	7,474	10,707	7,974	7,813	2,451
Milling									
Profile and Duplicator	5,074	3,062	1,643	2,499	1,645	2,992	D	D	2,325
Broaching	3,096	1,711	541	3,165	2,142	5,891	3,052	D	8,368
Sawing and Cut-off Machines	NA	NA	4,121	4,541	3,402	10,351	6,541	3,399	8,056
Transfer Machines	18,807	6,533	9,755	39,494	31,240	93,541	34,406	12,423	27,988
METAL FORMING									
Power Shearing									
Plate	2,322	765	1,554	2,699	3,303	8,023	7,942	7,944	5,044
Rotary								143	191
Bending and Forming, Power									
Bending Rolls, Sheet & Plate	800	1,799	2,313	2,348	9,194	3,592	3,413	3,936	2,727
Bending Brakes and Folders	1,025								
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mechanical Presses									
Vertical Straight-sided and Arch Frame (Excl. Knuckle Joint)									
Single Action, Single Point, 201 Tons and Over	940	2,256	2,766	1,256	D	5,452	D	D	D
Single Action, Two Point, 500 Tons and Under (a)	1,327								
Hydraulic and Pneumatic Extrusion Presses	7,120	2,194	D	1,905	D	D	D	D	D

NA - Not Available. D - Withheld to avoid disclosing individual companies' data.

(a) Beginning in 1973: Single Action, Two Point, 300 Tons and Under.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)

Units and Value, 1959 to 1972, Value 1973 to Date

(Values in Millions of Dollars)

	Total		Presses		Bending and Forming		Punching and Shearing		Forging		Other (b)	
Year	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value
1959	2,166	$ 31.3	714	$15.1	793	$ 4.1	226	$ 3.0	96	$ 5.3	337	$ 3.8
1960	2,716	47.3	893	23.3	913	5.6	307	5.1	173	9.0	430	4.2
1961	2,758	55.2	934	30.7	930	4.7	283	6.8	166	8.9	445	4.1
1962	3,026	59.6	1,032	32.7	971	5.4	322	5.5	203	10.9	498	5.1
1963	2,955	42.3	943	20.1	1,135	7.6	362	6.5	112	4.7	403	3.4
1964	3,533	47.2	1,006	21.3	1,609	7.3	314	5.0	152	8.4	452	5.2
1965	3,338	44.1	751	18.4	1,600	5.6	284	4.3	148	8.4	555	7.5
1966	3,029	46.5	840	17.9	1,421	9.4	322	3.2	103	6.6	523	9.5
1967	2,824	50.2	962	24.5	933	5.6	324	5.9	98	6.3	507	7.9
1968	3,050	46.9	872	23.7	1,382	5.7	316	4.9	111	5.4	369	7.2
1969	3,380	39.9	943	14.3	1,503	5.1	536	6.5	141	6.1	257	7.9
1970	3,574	47.0	1,047	17.4	1,539	5.5	560	5.1	161	11.2	267	7.7
1971	4,491	51.9	915	22.3	1,287	5.7	461	3.7	186	13.0	1,642	7.1
1972	3,088	50.2	838	18.8	1,382	5.8	401	3.8	152	14.5	315	7.3
1973	NA	54.5	NA	21.2	NA	6.2	NA	3.4	NA	13.2	NA	10.5
1974	NA	78.4	NA	D	NA	15.7	NA	8.3	NA	D	NA	18.6
1975	NA	98.6	NA	D	NA	14.9	NA	14.7	NA	D	NA	16.8
1976	NA	105.8	NA	D	NA	16.5	NA	17.4	NA	D	NA	16.8
1977	NA	71.7	NA	D	NA	13.5	NA	16.6	NA	D	NA	12.9
1978	NA	112.8	NA	D	NA	17.4	NA	14.7	NA	D	NA	18.7
1979	NA	112.0	NA	27.7	NA	24.5	NA	16.8	NA	D	NA	D
1980	NA	152.0	NA	35.2	NA	34.5	NA	32.6	NA	D	NA	D
1981(p)	NA	155.4	NA	43.1	NA	29.7	NA	29.6	NA	D	NA	D

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary.

(a) Complete new machines as shipped, including accessories, etc., ordered and shipped with the machines, f.o.b. factory.

(b) Some metalworking machines, other than metal forming type machines, are included prior to 1968.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

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6

WORLD MACHINE TOOL INDUSTRY

For many years American Machinist magazine has been publishing estimates of the world's machine tool production and trade. These estimates, which cover 33 countries, come from unofficial sources and are revised for previous years when "official" figures become available. Whenever possible, data include complete machine tools only and exclude parts and attachments. However, for some countries it is not clear if the totals include or exclude the value of parts.

Several years ago, the trade associations of 14 European countries (co-operating through a group called CECIMO) and the United States and Japanese trade associations agreed to develop a uniform international statistical reporting system. Under this system, the production, exports and imports of the participating countries are reported for seven major groups of metal cutting machine tools and three major groups of metal forming machine tools. Data by machine type for 1980 are included in this chapter. The machine tool production of the 16 countries totaled about $19.4 billion in 1980.

Harmonization

The United States is participating, through its International Trade Commission, in the technical work of the Harmonized Systems Committee of the Customs Co-Operation Council (CCC) in Brussels.

The objective of the work of the Customs Co-Operation Council is to extend the Brussels Tariff Nomenclature (BTN) into a worldwide, uniform nomenclature for use by customs officials. Such a system has obvious advantages for market analysis and for a variety of other purposes.

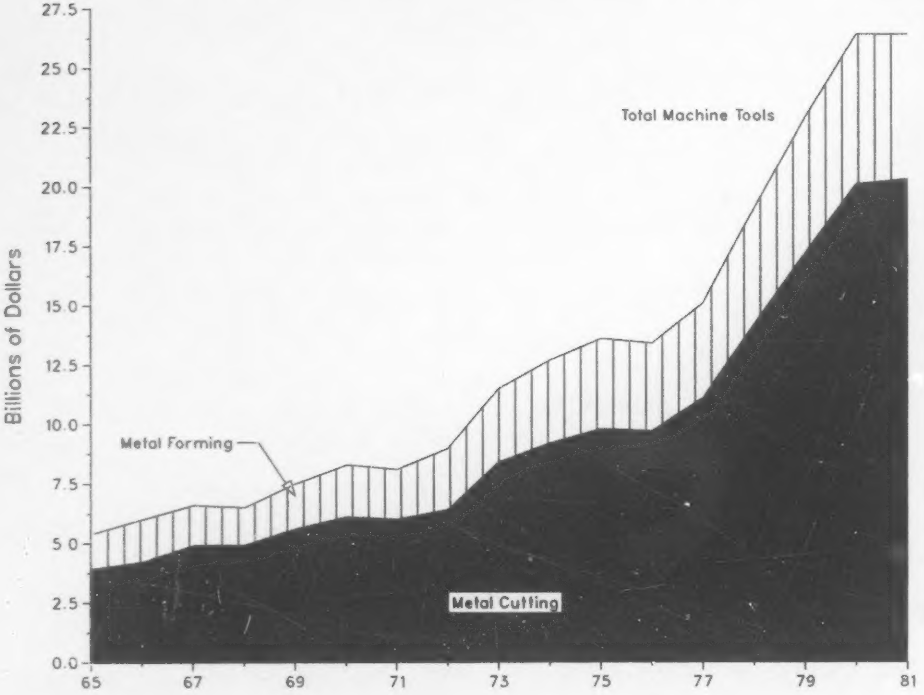
Machine tools are part of Chapter 84 which is currently under consideration. The International Trade Commission has presented proposed machine tool import and export classifications to the CCC for consideration. Discussions by the CCC are currently in progress but no significant changes have yet been ratified by the Council.

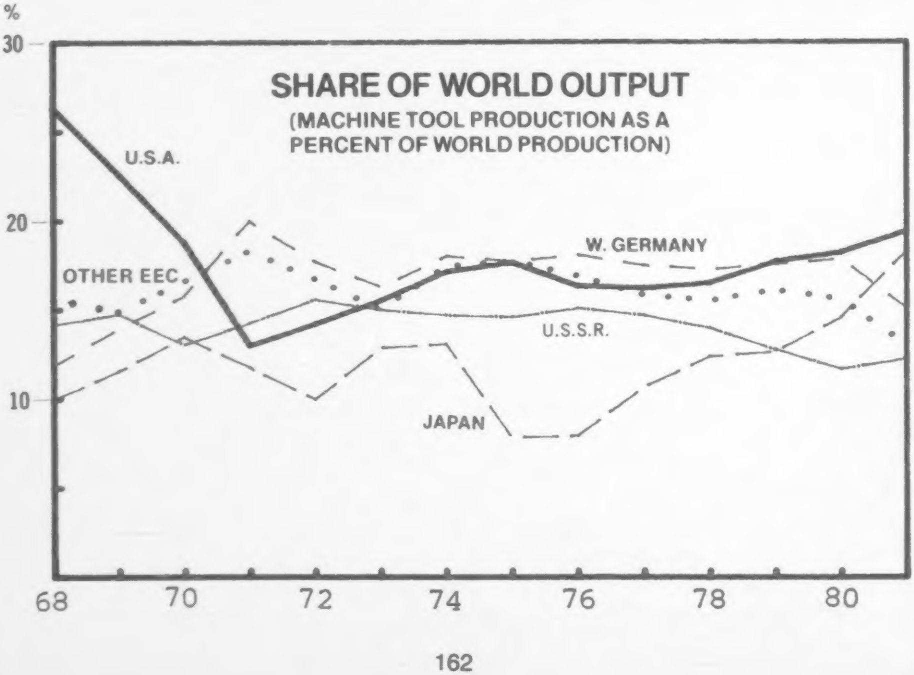
Foreign Exchange Rates

With the "floating" of many world currencies, the value measurement of production and trade statistics has become increasingly difficult and confusing. Foreign data in this Handbook have been converted into dollars on the basis of the trade conversion factors given in the International Monetary Fund's "International Financial Statistics."

In the uniform international statistical reporting system for CECIMO, each participating country reports its data in Swiss Francs. In this chapter, these data have been converted into dollars with the conversion rates below the tables. These tables can be identified with the source as International Statistics on Machine Tools.

WORLD MACHINE TOOL CONSUMPTION





WORLD MACHINE TOOL PRODUCTION, 1965 to Date

(Millions of U.S. Dollars) (a)

	Total	Metal Cutting	Metal Forming
1965	$ 5,411.3	$ 3,879.1	$1,379.5
1966	5,968.6	4,228.4	1,515.8
1967	6,624.2	4,894.3	1,678.7
1968	6,543.3	4,941.2	1,552.6
1969	7,474.6	5,590.9	1,833.7
1970	8,268.2	6,069.2	2,142.0
1971	8,148.9	5,951.5	2,192.4
1972	8,965.1	6,433.1	2,532.0
1973	11,548.1	8,393.2	3,154.9
1974	12,656.3	9,190.0	3,466.3
1975	13,640.0	9,844.3	3,795.7
1976	13,387.4	9,672.5	3,714.9
1977	15,126.5	11,079.8	4,046.7
1978	19,088.4	14,192.8	4,889.4
1979	22,925.1	17,170.1	5,755.0
1980(r)	26,501.3	20,268.4	6,232.8
1981(p)	26,397.7	20,338.4	6,059.6

p - Preliminary. r - Revised.

(a) Metal Cutting and Metal Forming may add to less than the total because a breakdown was not available for some countries.

Source: McGraw-Hill, Inc. "American Machinist", Uniform International Statistics on Machine Tools, and statistics reported by individual countries' machine tool associations.

For many years, the "American Machinist" has published estimates of world machine tool production. When it was possible to do so, parts and attachments were excluded. Beginning with 1974, the trade associations of 14 European countries, the United States, and Japan have been collecting statistics on production, exports, and imports on a uniform basis. For details, see chapter introduction.

LEADING MACHINE TOOL CONSUMING NATIONS (a)

1980 and 1981

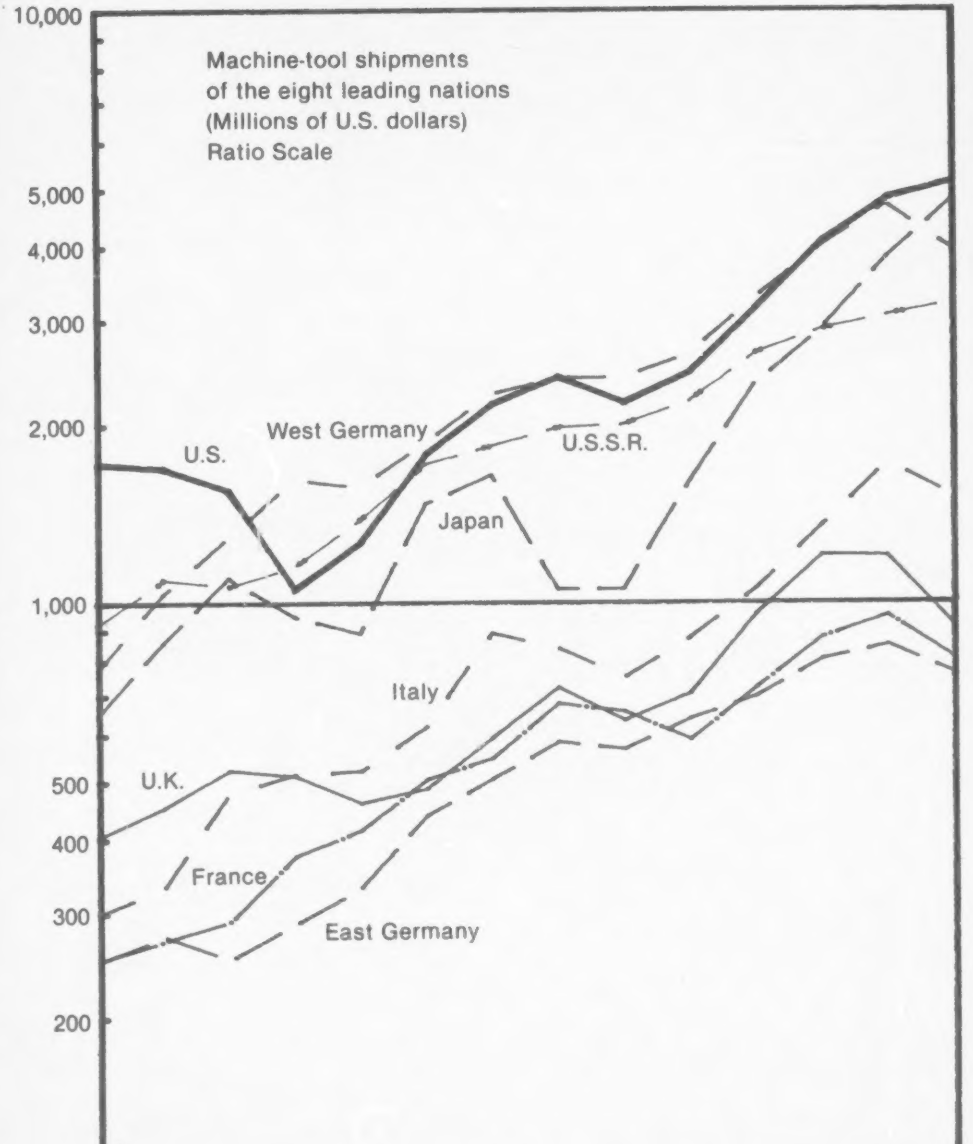
(Millions of U.S. Dollars)

			Percent Change(b)	
Country	1981	1980	U.S. Dollars	Nat'l. Currency
1. United States	$5,612.8	$5,338.0	5.1	5.1
2. Soviet Union	3,940.0	3,751.0	5.0	5.0
3. Japan	3,328.3	2,598.5	28.1	24.6
4. FRG (West Germany)	2,102.4	2,685.8	−21.7	−2.7
5. Italy	1,018.2	1,236.8	−17.7	9.3
6. France	985.6	992.2	−0.7	27.7
7. United Kingdom	837.2	1,149.7	−27.2	−16.5
8. Canada	793.9	637.5	24.5	27.7
9. Rumania	743.9	762.1	−2.4	−2.4
10. China	535.0	532.0	0.6	14.4
11. Mexico	470.0	327.9	43.3	53.1
12. GDR (East Germany)	427.8	453.7	−5.7	17.0
13. Brazil	372.5	418.9	−11.1	57.3
14. Korea	363.0	452.8	−19.8	−10.3
15. Poland	340.0	535.0	−36.4	—
16. Yugoslavia	312.9	335.2	−6.7	24.3
17. Sweden	305.1	260.1	17.3	35.8
18. Australia	272.7	172.3	58.3	56.7
19. Spain	261.7	202.7	29.1	66.2
20. Switzerland	257.2	349.0	−26.3	−13.6
21. India	242.9	208.8	16.3	28.1
22. South Africa	232.2	230.2	0.9	13.2
23. Czechoslovakia	190.7	221.8	−14.0	—
24. Hungary	173.9	166.7	4.3	12.4

(a) Machine tool consumption is domestic production plus imports and minus exports.

(b) Percent change calculations based on U.S. dollars include the effect of changes in currency conversion rates. Percent change calculations based on national currency differ for some countries. These percent change values are not influenced by currency conversion rates and, therefore, may more realistically reflect changes in a nation's machine tool consumption.

Source: McGraw-Hill, Inc., "American Machinist", International Statistics on Machine Tools and NMBTA.


10,000
Machine-tool shipments
of the eight leading nations
(Millions of U.S. dollars)
Ratio Scale
5,000
4,000
3,000
2,000
1,000
500
400
300
200
0
U.S.
West Germany
U.S.S.R.
Japan
Italy
U.K.
France
East Germany
68
69
70
71
72
73
74
75
76
77
78
79
80
81

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1981 (ESTIMATED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. United States	$ 5,130.9	$ 4,051.7	$1,079.2	$ 949.6	$1,431.5
2. Japan	4,798.2	3,861.4	936.8	1,685.5	215.6
3. FRG (West Germany)	3,953.4	2,774.2	1,179.3	2,448.8	597.8
4. Soviet Union*	3,220.0	2,495.0	725.0	320.0	1,040.0
5. Italy	1,513.1	1,030.8	482.3	795.2	300.3
6. United Kingdom	918.9	735.1	183.8	490.1	408.4
7. France	809.5	618.1	191.5	390.5	566.6
8. Switzerland	808.7	768.3	40.4	740.3	188.8
9. GDR (East Germany)*	761.5	590.9	170.6	553.5	219.8
10. Rumania*	602.0	553.0	49.0	129.1	271.0
11. China*	440.0(c)	330.0(c)	110.0(c)	30.0(c)	125.0(c)
12. Czechoslovakia*	335.6	283.7	51.9	324.2	179.3
13. Spain	326.6	228.6	98.0	206.8	141.9
14. Brazil	319.5	248.7	70.8	86.0	139.0
15. Poland*	310.0(c)	270.0(c)	40.0(c)	170.0(c)	200.0(c)
16. Yugoslavia	271.0	163.8	107.3	79.8	121.7
17. Sweden	286.0	171.5	114.5	215.3	234.4
18. Taiwan	239.4	230.4	9.0	181.6E	108.3
19. Canada	216.3	166.9	49.4	96.9	674.5
20. Korea	203.0	130.0	73.0	40.0	200.0
21. India	196.6	161.9	34.7	23.1	69.4
22. Austria	143.9	95.6	48.3	141.4	165.2
23. Hungary*	125.9	111.2	14.7	94.9	142.9
24. Belgium	102.9	36.6	66.3	115.9	134.2
25. Australia	66.7(c,j)	46.0(c,j)	20.7(c,j)	1.2(j)	207.2(j)
26. Netherlands	52.2	27.3	24.9	72.3	112.5
27. Bulgaria*	46.0(c)	43.0(c)	3.0(c)	25.0(c)	26.0(c)
28. Argentina	44.3(c)	24.3(c)	20.0(c)	19.5	70.0
29. Singapore	43.7	38.7	5.0	40.2	117.4
30. Denmark	40.7	17.3	23.4	23.8	29.9
31. South Africa	30.9	15.1	15.8	5.0(c)	206.3(c)
32. Mexico	24.0(c)	12.0(c)	12.0(c)	4.0(c)	450.0(c)
33. Portugal	16.3	7.3	9.0	6.5	37.4
Total	26,397.7	[illegible],338.4	6,059.6	10,506.0	9,132.3

E - Estimate by NMTBA.

(c) Rough estimate from fragmentary data.
(j) Year ended June 30.

* - Countries with controlled currencies. The Soviet Union has been converted at 80% of the official rate; GDR has been converted at 65% of the current FRG rate; Czechoslovakia, Hungary, Poland and Romania were at the official rate; China and Bulgaria are rough estimates based on estimates of the amount of production.

Exchange Rates: All free-market currencies have been converted at rates in effect for the period covered. Most estimates for 1981 have been converted at International Monetary Fund rates for the first nine months of 1981 plus estimates of bank transfer rates for the last three months; the rest have been converted at 1981 average rates.

Notes: Whenever possible, data include machine tools only, excluding parts and attachments.

Source: McGraw-Hill, Inc., "American Machinist" and NMTBA.

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1980 (REVISED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. United States	$ 4,812.3	$ 3,716.4	$ 1,095.9	$ 734.1	$ 1,259.8
2. FRG (West Germany)	4,707.0	3,306.1	1,400.9	2,797.6	776.4
3. Japan	3,830.3	3,012.3	818.0	1,452.9	221.1
4. Soviet Union*	3,065.0	2,375.0	690.0	301.8	987.8
5. Italy	1,728.0	1,169.9	558.1	847.6	356.4
6. United Kingdom	1,201.7	977.7	224.0	674.2	622.2
7. Switzerland	994.0	923.0	71.0	870.2	225.2
8. France	954.0	756.9	197.1	515.9	554.1
9. GDR (East Germany)*	891.5	691.8	199.7	695.3	257.5
10. Rumania*	590.0	542.0	48.0	144.8	316.9
11. China*	420.0(u)	315.0(u)	105.0(u)	28.0(u)	140.0(u)
12. Poland*	405.0(u)	355.0(u)	50.0(u)	220.0(u)	350.0(u)
15. Czechoslovakia*	331.5	275.3	56.2	323.1	213.4
14. Spain	327.7	244.4	83.3	228.2	103.2
13. Brazil	314.8	245.0	69.8	71.2	175.3
18. Taiwan	245.1	237.5	7.6	178.3	125.1
17. Sweden	232.9	151.5	81.4	164.3	191.5
16. Yugoslavia	231.8	168.4	63.4	83.3	186.7
19. Canada	193.8	149.1	44.7	85.2	528.9
20. India	162.7	128.9	33.8	17.5	63.6
21. Belgium	137.2	54.3	82.9	135.1	205.6
22. Korea	135.0	86.0	49.0	26.5	344.3
23. Hungary*	121.3	109.5	11.8	93.8	139.2
24. Austria	127.8	80.0	47.8	131.3	165.6
25. Netherlands	64.7	33.4	31.3	89.3	157.3
26. Argentina	50.0(u)	20.0(u)	30.0(u)	27.7	95.4
27. Denmark	49.1E	24.4E	24.7E	85.9E	92.6E
28. Bulgaria*	43.0(u)	40.0(u)	3.0(u)	22.0(u)	24.0(u)
29. Singapore	36.9	32.7	4.2	38.3	103.3
30. South Africa	29.6	14.5	15.0	5.1(u)	205.7(u)
31. Portugal	28.0E	12.3E	15.7E	6.6E	30.0E
32. Mexico	21.6(u)	10.4(u)	11.2(u)	3.7(u)	310.0(u)
33. Australia	18.0(u,j)	9.7(u,j)	8.3(u,j)	1.1(u,j)	155.4(u,j)
Total	26,501.3	20,268.4	6,232.8	11,099.9	9,683.5

E - Estimate by NMTBA.

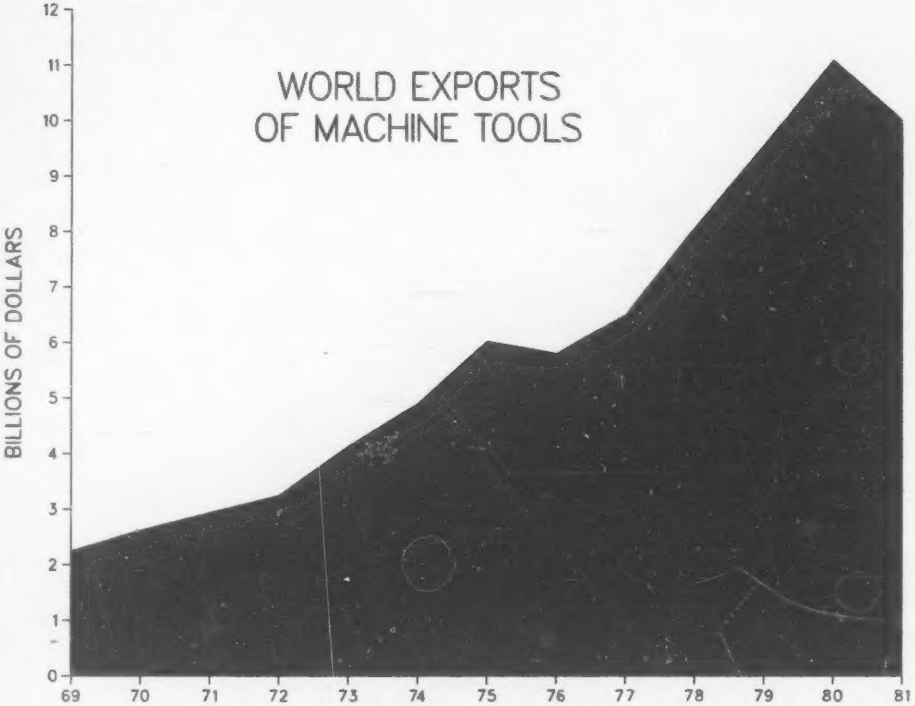
(c) Rough estimate from fragmentary data.
(j) Year ended June 30.
(u) Unrevised.

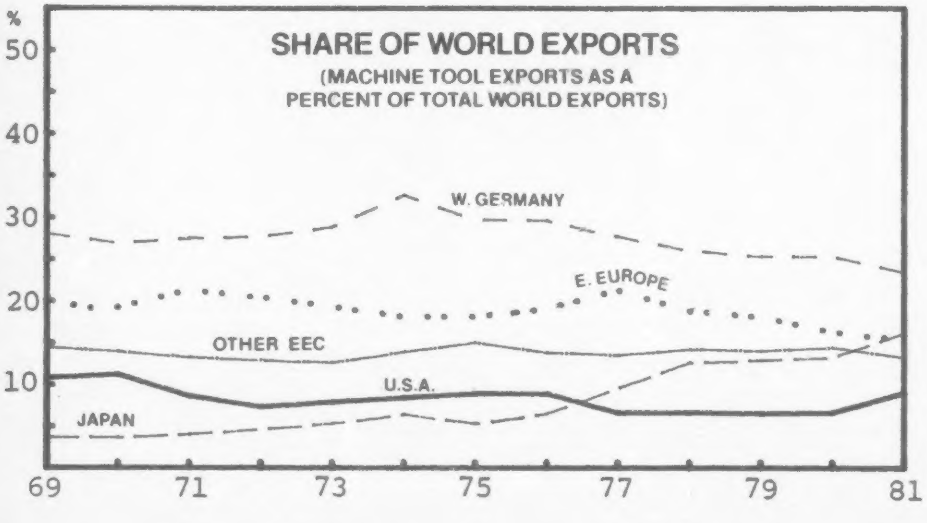
* - Countries with controlled currencies. The Soviet Union has been converted at 80%, of the official rate; GDR has been converted at 65% of the current FRG rate; Czechoslovakia, Hungary, Poland, Romania were at the official rate; China and Bulgaria are rough estimates based on estimates of the amount of production.

Exchange Rates: All free market currencies have been converted at rates for the period covered. Values were converted at average market rates for 1980 as reported by the International Monetary Fund.

Notes: Whenever possible, data include complete machine tools only, excluding parts and attachments.

Source: McGraw-Hill, Inc., "American Machinist", and International Statistics on Machine Tools.


WORLD EXPORTS
OF MACHINE TOOLS
BILLIONS OF DOLLARS
0
1
2
3
4
5
6
7
8
9
10
11
12
69
70
71
72
73
74
75
76
77
78
79
80
81


%
50
40
30
20
10
SHARE OF WORLD EXPORTS
(MACHINE TOOL EXPORTS AS A
PERCENT OF TOTAL WORLD EXPORTS)
W. GERMANY
E. EUROPE
OTHER EEC
U.S.A.
JAPAN
69
71
73
75
77
79
81

PRODUCTION, EXPORTS AND IMPORTS OF MACHINE TOOLS
Selected Countries, 1978 to Date
(Millions of U.S. Dollars)

Country	Production			Exports			Imports		
	1978	1979	1980	1978	1979	1980	1978	1979	1980
Austria	$ 93.9	$ 101.1	$ 127.8	$ 93.9	$ 118.0	$ 131.3	$ 98.4	$ 135.6	$ 165.6
Belgium	123.1	130.8	137.2	98.4	110.8	135.1	113.0	127.0	205.6
Denmark	56.2E*	69.2E	49.1*	51.7*E	64.6E	85.9*	65.8*E	73.4E	92.6*
France	724.8	877.2	953.9	383.5	458.2	516.1	290.1	371.6	554.0
India	104.6	127.1	162.7	NA	18.5	17.5	NA	NA	63.6*
Italy	1,061.6	1,354.0	1,728.0	597.7	689.0	847.6	195.1	255.0	356.1
Japan	2,371.7	2,896.1	3,830.3	1,018.8	1,238.7	1,461.0	122.0	164.8	221.4
Netherlands	54.5	NA	74.4	64.1	70.8	91.6	122.0	129.1	155.0
Norway	5.6*E	6.5E	7.1*E	3.4*E	4.7E	4.5*	52.9*E	50.2E	69.6*
Portugal	12.9	22.4	28.0*E	3.9	5.7	6.6*E	30.4	32.7	30.0*E
Spain	232.2	315.8	327.7	148.4	210.8	228.2	90.0	91.3	103.2
Sweden	166.4	199.2	231.7	138.9	175.2	180.9	109.6	126.9	184.9
Switzerland	772.5	930.4	994.0	656.7	790.9	869.9	NA	139.6	320.0*
United Kingdom	811.4	1,027.4	1,201.7	424.5	472.2	674.2	398.1	601.1	622.2
United States	3,004.3	4,060.0	4,812.3	531.9	621.0	734.1	715.3	1,044.0	1,259.8
West Germany	3,280.3	4,009.5	4,708.1	2,122.6	2,509.2	2,964.7	461.6	621.4	802.2

NA - Not Available. E - Estimate. * Includes Parts and Accessories.

Exchange Rate: 1978 $1 = 1.7785 Swiss Francs; 1979 $1 = 1.6627 Swiss Francs; 1980 $1 = 1.6757 Swiss Francs.

Source: International Statistics on Machine Tools jointly prepared by CECIMO (Comité Européen de Coopération des Industries de la Machine Outil); JMTBA (Japan Machine Tool Builders' Association); and NMTBA.

PRODUCTION, EXPORTS AND IMPORTS OF MACHINE TOOLS

Selected Countries, 1980

(Millions of U.S. Dollars)

Country	Production			Exports			Imports		
	Total	Cutting	Forming	Total	Cutting	Forming	Total	Cutting	Forming
Austria	$ 127.8	$ 80.0	$ 47.8	$ 131.3	$ 79.2	$ 52.1	$ 165.6	$ 105.5	$ 60.1
Belgium	137.2	54.3	82.9	135.1	70.9	64.2	205.6	150.5	55.1
Denmark(E)	49.1	NA	NA	85.9	NA	NA	92.6	NA	NA
France	953.9	728.6	225.3	516.1	343.4	172.7	554.0	401.8	152.2
India	162.7	129.5	33.2	17.5	15.5	2.0	63.6E	NA	NA
Italy	1,728.0	1,169.9	558.1	847.6	636.3	211.3	356.1	280.2	75.9
Japan	3,830.3	3,012.3	818.0	1,461.0	1,188.9	272.1	221.4	168.6	52.8
Netherlands	74.4	NA	NA	91.6	45.3	46.3	155.0	110.2	44.8
Norway*	7.1E	NA	NA	4.5	NA	NA	69.6	NA	NA
Portugal*(E)	28.0	NA	NA	6.6	NA	NA	30.0	NA	NA
Spain	327.7	244.4	83.3	228.2	174.9	53.3	103.2	67.1	36.1
Sweden	231.7E	141.9E	89.8E	180.9	112.3	68.6	184.9	131.2	53.7
Switzerland	994.0	923.0	71.0	869.9	831.1	38.8	320.0	NA	NA
United Kingdom(E)	1,201.7	977.7	224.0	674.2	540.5	133.7	622.2	486.7	135.5
United States	4,815.0	3,718.0	1,097.0	735.0	463.0	272.0	1,260.0	1,030.0	230.0
West Germany	4,708.1	3,313.5	1,394.6	2,964.7	1,958.5	1,006.2	802.2	590.9	211.3

NA - Not Available. E - Estimate. * Includes Parts and Accessories.

Exchange Rate: $1 = 1.6757 Swiss Francs.

Source: International Statistics on Machine Tools jointly prepared by CECIMO (Comité Européen de Coopération des Industries de le Machine Outil); IMTMA (Indian Machine Tool Manufacturers' Association); JMTBA (Japan Machine Tool Builders' Association); and NMTBA.

The Uniform International Statistics prepared by CECIMO indicate 1980 production by 16 countries of $19.4 billion of machine tools. Individual country figures on the following pages may differ because of problems in conversion of exchange rates, differences in reporting practices, etc.

PRODUCTION OF METAL CUTTING MACHINE TOOLS
Selected Countries, 1980
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 80.0	$ 7.8	(a)	$ 0.0	$ 16.7	$ 28.5	$ 12.4	$ 14.6
Belgium	54.3	(b)	(b)	(b)	(b)	(b)	(b)	54.3
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	728.6	2.1	$ 17.5	0.0	67.7	167.3	167.8	306.2
India	129.5	14.4	8.4	4.7	9.2	51.9	15.1	25.8
Italy	1,169.9	103.9	71.2	7.0	147.1	326.9	123.8	390.0
Japan	3,012.4	135.6	59.5	67.3	331.7	972.8	264.8	1,180.7
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA
Norway	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	244.4	14.1	14.4	0.1	26.1	66.5	61.6	61.6
Sweden(E)	142.0	16.6	(a)	0.0	47.3	49.7	24.6	3.8
Switzerland	923.0	(b)	(b)	(b)	(b)	(b)	(b)	923.0
United Kingdom(E)	977.7	29.5	31.6	23.3	168.0	319.6	92.6	313.1
United States	3,718.0	193.0	187.0	130.0	556.0	827.0	340.0	1,485.0
West Germany	3,313.5	178.2	113.9	159.0	570.5	874.7	455.5	961.7

NA - Not Available. E - Estimate. Exchange Rate: $1 = 1.6757 Swiss Francs.

(a) Included in "Boring Machines".
(b) Included in "Other Metal Cutting".

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

PRODUCTION OF METAL FORMING MACHINE TOOLS
Selected Countries, 1980
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses Including Forging	Other Metal Forming
Austria	$ 47.8	$ 3.5	$ 4.8	$ 39.5
Belgium	82.9	(a)	(a)	82.9
Denmark	NA	NA	NA	NA
France	225.3	32.2	102.0	91.1
India	33.2	3.4	18.1	11.7
Italy	558.1	53.7	206.7	297.7
Japan	818.0	94.6	623.3	100.1
Netherlands	NA	NA	NA	NA
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	83.3	13.9	39.1	30.2
Sweden(E)	89.8	50.1	(b)	39.7
Switzerland	71.0	(a)	(a)	71.0
United Kingdom(E)	224.0	NA	82.8	141.2
United States	1,097.0	205.0	441.0	451.0
West Germany	1,394.6	170.5	649.2	574.9

NA - Not Available. E - Estimate. Exchange Rate: $1 = 1.6757 Swiss Francs.

(a) Included in "Other Metal Forming".
(b) Included in "Punching & Shearing".

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

IMPORTS OF METAL CUTTING MACHINE TOOLS
Selected Countries, 1980
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 105.5	$15.9	(a)	$ 0.3	$ 23.7	$ 24.3	$ 24.5	$ 16.8
Belgium	150.5	24.3	$22.2	2.7	19.3	45.2	20.3	16.5
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	401.8	7.1	33.1	11.6	73.6	126.4	62.0	88.0
India	NA	NA	NA	NA	NA	NA	NA	NA
Italy	280.2	17.5	11.7	9.3	31.5	80.6	40.9	88.7
Japan	168.6	5.9	5.1	32.8	55.7	22.4	23.2	23.5
Netherlands	110.1	8.0	10.6	1.0	18.1	36.2	19.6	16.6
Norway	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	67.1	0.9	2.3	0.3	15.5	19.9	3.7	24.5
Sweden	131.2	7.3	(a)	2.6	21.5	42.1	26.0	31.7
Switzerland	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom	486.8	41.1	27.2	10.7	77.2	137.7	66.8	126.1
United States	1,030.0	57.0	27.0	41.0	139.0	400.0	138.0	228.0
West Germany	591.0	68.2	54.5	12.7	120.5	189.3	82.5	63.3

NA - Not Available. Exchange Rate: $1 = 1.6757 Swiss Francs.

(a) Included in "Boring Machines".

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

IMPORTS OF METAL FORMING MACHINE TOOLS
Selected Countries, 1980
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 60.0	$11.0	$12.4	$ 36.6
Belgium	55.1	13.7	13.4	28.0
Denmark	NA	NA	NA	NA
France	152.2	36.2	40.5	75.5
India	NA	NA	NA	NA
Italy	75.8	9.3	31.5	35.0
Japan	52.8	5.3	12.2	35.3
Netherlands	44.8	12.1	12.6	20.1
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	36.1	1.7	15.7	18.7
Sweden	53.7	31.9	(a)	21.8
Switzerland	NA	NA	NA	NA
United Kingdom	135.6	39.4	45.6	50.6
United States	230.0	43.0	68.0	119.0
West Germany	211.3	29.2	60.0	122.1

NA - Not Available. Exchange Rate: $1 = 1.6757 Swiss Francs.

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF METAL CUTTING MACHINE TOOLS

Selected Countries, 1980

(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Machines
Austria	$ 79.2	$ 8.4	$ (a)	$ 0.0	$ 14.8	$ 38.2	$ 12.9	$ 4.9
Belgium	70.8	5.4	11.6	6.8	5.3	34.2	3.6	3.9
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	343.5	5.0	14.0	2.4	63.4	107.0	84.5	67.2
India	15.5	0.4	1.4	0.0	1.0	8.4	1.8	2.5
Italy	636.3	75.9	56.0	3.5	77.1	129.6	82.9	211.3
Japan	1,188.8	54.2	28.6	13.9	116.0	522.1	75.1	378.9
Netherlands	45.3	8.6	4.0	0.5	14.6	8.6	4.5	4.5
Norway	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	175.0	11.3	11.9	0.1	14.3	39.3	74.3	23.8
Sweden	112.2	13.2	(a)	0.2	41.1	39.7	14.9	3.1
Switzerland	831.1	(b)	(b)	(b)	(b)	(b)	(b)	831.1
United Kingdom (E)	540.6	31.9	31.2	17.6	106.5	178.4	94.4	80.6
United States	463.0	20.0	22.0	61.0	85.0	81.0	19.0	175.0
West Germany	1,958.4	125.4	53.4	96.8	423.6	549.0	273.4	436.8

NA - Not Available. E - Estimate. Exchange Rate: $1 = 1.6757 Swiss Francs.

(a) Included in "Boring Machines".
(b) Included in "Other Metal Cutting".

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF METAL FORMING MACHINE TOOLS

Selected Countries, 1980

(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses Including Forging	Other Metal Forming
Austria	$ 52.0	$ 2.6	$ 2.6	$ 46.8
Belgium	64.2	11.3	29.9	23.0
Denmark	NA	NA	NA	NA
France	172.7	27.7	42.1	102.9
India	2.0	0.1	0.8	1.1
Italy	211.3	25.7	66.5	119.1
Japan	272.0	56.1	98.8	117.1
Netherlands	46.3	10.6	6.5	29.2
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	53.3	11.3	20.9	21.1
Sweden	68.5	41.8	(a)	26.7
Switzerland	38.8	(b)	(b)	38.8
United Kingdom(E)	133.6	20.1	50.6	62.9
United States	272.0	45.0	70.0	157.0
West Germany	1,006.3	132.6	292.7	581.0

NA - Not Available. E - Estimate. Exchange Rate: $1 = 1.6757 Swiss Francs.

(a) Included in "Punching & Shearing".
(b) Included in "Other Metal Forming".

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
World																		
1973	$2,969	100.0	$357	12.0	$1,182	39.8	$214	7.2	$309	10.4	$236	8.0	$216	7.3	$188	6.3	$ 74	2.5
1974	3,886	100.0	449	12.6	1,567	40.3	307	7.9	398	10.3	319	8.2	250	6.4	236	6.1	93	2.4
1975	4,620	100.0	580	12.5	1,748	37.8	309	6.7	440	9.5	431	9.3	362	7.8	320	6.9	113	2.5
1976	4,428	100.0	553	12.5	1,670	37.7	363	8.2	457	10.3	364	8.2	317	7.2	272	6.1	115	2.6
1977	4,855	100.0	458	9.4	1,772	36.5	611	12.6	498	10.2	437	9.0	323	6.7	269	5.5	123	2.5
1978	6,279	100.0	584	9.3	2,086	33.2	1,017	16.2	659	10.5	598	9.3	426	6.9	383	6.1	139	2.2
1979	7,439	100.0	684	9.2	2,441	32.8	1,229	16.5	792	10.6	690	9.2	473	6.4	459	6.2	176	2.4
Industrial Countries																		
United States																		
1973	188	100.0	—	—	52	27.8	22	11.9	21	11.4	11	6.0	22	11.6	10	5.5	6	3.1
1974	308	100.0	—	—	85	27.6	52	16.7	36	11.6	20	6.4	30	9.9	14	4.4	10	3.2
1975	322	100.0	—	—	95	29.4	54	16.8	29	9.1	17	5.3	39	12.2	15	4.6	11	3.3
1976	317	100.0	—	—	97	30.7	70	22.0	27	8.5	15	4.7	34	10.8	9	2.7	8	2.7
1977	422	100.0	—	—	106	25.0	111	26.4	35	8.3	17	4.1	47	11.0	10	2.5	18	4.2
1978	678	100.0	—	—	164	24.3	219	32.3	59	8.7	30	4.4	73	10.8	18	2.6	23	3.4
1979	974	100.0	—	—	191	19.6	365	37.5	71	7.3	41	4.2	96	9.8	26	2.6	32	3.3
West Germany																		
1973	163	100.0	13	7.8	—	—	7	4.4	46	28.0	27	16.6	19	11.7	20	12.0	8	4.6
1974	167	100.0	17	10.4	—	—	8	4.8	50	29.8	24	14.1	13	7.8	20	11.9	47	3.9
1975	191	100.0	14	7.4	—	—	9	4.9	54	28.5	30	16.0	18	9.5	26	13.4	7	3.9
1976	201	100.0	17	8.2	—	—	10	4.9	60	30.0	28	13.8	19	9.3	21	10.5	10	4.9
1977	290	100.0	25	8.5	—	—	23	7.9	80	27.5	53	18.3	23	7.8	27	9.4	16	5.5
1978	381	100.0	31	8.1	—	—	39	10.2	122	32.1	56	14.6	29	7.6	35	9.0	14	3.7
1979	537	100.0	32	5.9	—	—	83	15.4	174	32.4	71	13.2	31	5.9	48	9.0	18	3.2

(Continued)

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
France																		
1973	$245	100.0	$ 17	6.8	$126	51.3	$ 1	.5	$32	13.2	$30	12.2	$16	6.4	—	—	$ 4	1.5
1974	268	100.0	12	4.5	146	54.3	2	.6	34	12.7	33	12.3	15	5.7	—	—	3	1.3
1975	355	100.0	16	4.5	196	55.3	1	.4	41	11.7	52	14.7	19	5.4	—	—	5	1.4
1976	320	100.0	19	5.9	162	50.7	2	.7	43	13.6	41	12.9	18	5.8	—	—	6	1.8
1977	256	100.0	11	4.3	135	52.8	2	.9	33	12.9	38	14.8	17	6.5	—	—	3	1.1
1978	267	100.0	13	5.0	117	43.8	5	1.9	48	17.9	46	17.3	16	5.9	—	—	6	2.2
1979	342	100.0	22	6.5	145	42.5	10	3.2	58	17.0	55	16.0	22	6.4	—	—	6	1.6
United Kingdom																		
1973	139	100.0	20	14.5	59	42.0	3	1.9	22	15.9	10	7.1	—	—	$ 7	4.8	7	5.1
1974	194	100.0	28	14.4	87	44.9	6	3.3	22	13.0	15	7.8	—	—	10	5.0	10	5.1
1975	220	100.0	35	16.1	90	40.9	9	4.2	25	11.2	16	7.1	—	—	17	7.8	10	4.5
1976	219	100.0	38	17.5	90	41.2	9	4.1	23	10.7	12	5.3	—	—	11	5.2	14	6.2
1977	223	100.0	27	12.2	90	40.2	12	5.5	27	11.9	19	8.5	—	—	13	6.0	10	4.3
1978	356	100.0	50	14.2	149	41.7	24	6.8	37	10.4	28	7.7	—	—	19	5.3	15	4.1
1979	521	100.0	87	16.7	214	41.1	46	8.9	51	9.7	44	8.5	—	—	33	6.3	20	3.8
Canada																		
1973	88	100.0	59	66.5	9	10.1	4	4.1	1	1.5	2	2.6	8	9.0	2	2.8	1	.7
1974	105	100.0	67	64.3	10	9.3	4	4.1	2	1.6	4	3.6	12	11.7	3	2.8	2	1.5
1975	126	100.0	79	62.4	14	11.5	6	4.4	2	2.0	5	3.9	13	10.1	4	2.9	2	1.7
1976	114	100.0	81	71.2	8	7.3	6	5.0	1	.5	4	3.7	9	7.8	2	1.5	2	1.7
1977	109	100.0	63	57.7	13	12.4	7	6.8	2	1.5	6	5.5	10	9.6	2	2.2	2	2.3
1978	136	100.0	82	60.1	15	11.2	9	6.9	2	1.5	10	7.0	10	7.2	4	3.1	3	1.9
1979	180	100.0	105	58.1	19	10.7	14	7.6	2	1.3	13	7.1	16	8.8	4	2.1	5	2.9
Switzerland																		
1973	80	100.0	2	3.0	53	66.2	1	.7	—	—	8	9.8	6	7.2	6	7.8	2	2.0
1974	87	100.0	4	4.8	55	63.2	1	.6	—	—	9	10.0	6	6.9	7	7.8	2	2.2
1975	72	100.0	4	5.8	40	55.5	(c)	.2	—	—	9	12.6	7	9.0	7	9.9	2	2.6
1976	63	100.0	3	4.6	37	58.2	(c)	.4	—	—	8	12.9	8	12.3	3	5.2	1	1.6
1977	82	100.0	3	4.2	50	61.4	1	1.1	—	—	10	11.8	7	8.1	6	6.8	2	2.2
1978	134	100.0	5	3.5	80	59.6	2	1.5	—	—	17	12.9	11	8.1	12	8.6	3	2.1
1979	157	100.0	7	4.5	92	58.5	4	2.7	—	—	19	12.1	10	6.5	12	7.9	3	1.9

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Japan																		
1973	$ 95	100.0	$41	43.3	$30	31.1	—	—	$15	15.3	$ 2	1.8	$ 3	3.1	$ 2	2.6	$1	.9
1974	147	100.0	50	34.1	64	43.6	—	—	16	11.2	3	2.0	6	3.9	2	1.3	2	1.2
1975	100	100.0	42	42.4	38	37.6	—	—	8	7.6	1	1.0	3	2.9	2	1.7	1	1.2
1976	60	100.0	27	45.7	15	25.7	—	—	11	17.8	1	1.4	2	3.9	2	2.5	(c)	.7
1977	75	100.0	23	30.4	35	47.4	—	—	8	10.3	1	1.8	1	1.6	2	3.1	1	1.9
1978	102	100.0	40	39.1	37	36.2	—	—	15	14.6	1	.7	2	2.1	1	1.0	2	1.7
1979	153	100.0	51	33.0	65	42.5	—	—	20	12.9	2	1.0	3	2.1	2	1.3	3	1.8
Developing Countries																		
Brazil																		
1973	138	100.0	44	31.8	53	38.2	$ 8	5.9	10	7.2	8	5.6	5	3.8	2	1.8	3	2.1
1974	203	100.0	38	18.9	98	48.6	14	6.9	11	5.7	18	9.0	11	5.6	3	1.2	2	1.1
1975	273	100.0	56	20.4	94	27.3	26	6.5	11	2.3	55	7.3	16	5.6	6	2.2	3	.6
1976	236	100.0	88	37.2	74	31.5	18	7.6	8	3.5	20	8.5	15	6.5	6	2.5	2	.7
1977	172	100.0	41	23.7	63	36.8	21	12.1	6	3.8	21	12.0	12	7.0	3	1.7	1	.7
1978	211	100.0	32	15.0	76	36.0	38	17.9	17	7.9	29	13.8	10	4.7	5	2.3	2	.9
1979	187	100.0	24	13.0	95	50.6	22	11.8	8	4.4	15	7.8	7	3.8	2	1.2	8	4.2
Republic of Korea																		
1973	37	100.0	9	24.4	1	2.4	25	67.6	1	1.6	(c)	.2	1	2.8	(c)	.8	(c)	(d)
1974	55	100.0	4	6.5	9	16.1	41	73.9	1	1.2	(c)	(d)	(c)	.7	(c)	.1	(c)	(d)
1975	81	100.0	5	6.3	11	14.1	40	49.3	2	1.9	(c)	.1	9	11.4	12	14.9	(c)	.2
1976	98	100.0	5	5.6	7	7.6	65	67.0	1	1.5	(c)	.2	16	16.0	(c)	.2	(c)	.2
1977	164	100.0	7	4.2	18	10.9	133	81.1	2	1.4	(c)	.1	2	1.3	1	.6	(c)	.2
1978	323	100.0	24	7.5	39	12.1	231	71.6	9	2.9	1	.2	8	2.4	7	2.3	2	.5
1979	376	100.0	34	9.1	85	22.6	212	56.4	8	2.2	4	1.1	14	3.7	13	3.4	1	.4
Spain																		
1973	115	100.0	11	9.5	50	43.8	(c)	.2	10	8.7	13	11.7	9	7.9	15	12.8	3	2.5
1974	128	100.0	6	4.8	60	46.7	2	1.4	13	10.0	13	10.3	7	5.7	18	14.4	2	1.9
1975	174	100.0	28	16.2	71	40.5	1	.5	11	6.0	18	10.5	19	10.7	12	7.0	3	1.8
1976	102	100.0	6	5.7	46	45.0	2	2.1	5	4.8	13	12.9	11	10.6	9	8.8	3	2.6
1977	91	100.0	4	4.7	38	41.4	6	6.4	8	8.6	14	14.9	5	5.4	10	11.0	1	1.1
1978	89	100.0	4	4.3	37	42.0	3	3.9	6	7.1	16	17.9	4	4.7	15	16.6	1	.9
1979	95	100.0	5	5.0	42	44.0	2	1.9	5	5.1	22	22.9	5	5.6	12	12.1	1	.6

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Venezuela																		
1973	$17	100.0	$ 7	41.9	$ 3	15.9	(c)	1.0	(c)	1.7	$ 4	25.2	(c)	2.3	(c)	.5	(c)	1.8
1974	23	100.0	6	25.4	6	25.3	(c)	.5	(c)	1.4	7	31.9	$ 1	2.3	$ 1	4.0	(c)	1.9
1975	45	100.0	12	27.4	8	16.8	(c)	.7	(c)	1.1	17	37.6	2	4.2	3	5.6	$ 1	1.1
1976	55	100.0	19	35.1	11	19.9	$1	1.9	$ 1	1.4	16	28.7	2	4.4	1	2.0	1	1.4
1977	75	100.0	20	27.1	16	21.6	1	1.4	3	4.5	23	31.0	3	4.3	1	1.8	1	1.1
1978	85	100.0	27	31.8	16	18.5	5	5.5	2	2.2	21	24.9	3	3.3	4	4.4	1	1.1
1979	88	100.0	46	52.8	8	9.0	4	4.6	2	1.9	21	23.4	3	2.4	(c)	.5	(c)	.5
Mexico																		
1973	49	100.0	23	45.8	17	35.4	1	1.1	2	3.4	2	3.8	2	3.2	1	1.6	1	1.8
1974	71	100.0	35	49.5	19	27.1	2	2.3	2	2.3	5	6.4	2	3.2	4	5.1	1	1.0
1975	77	100.0	41	52.7	16	21.0	2	2.4	2	3.1	6	7.2	4	5.6	3	3.8	1	1.1
1976	90	100.0	53	59.3	17	18.4	1	1.1	3	3.0	5	6.1	4	4.8	3	3.6	1	.9
1977	70	100.0	42	60.1	8	10.9	9	12.1	2	2.8	4	6.2	2	3.4	(c)	.5	1	.9
1978	75	100.0	38	50.5	15	20.5	7	9.2	2	3.2	4	5.1	4	4.8	1	.9	1	1.9
1979	121	100.0	70	58.2	20	16.7	7	5.7	3	2.9	8	6.8	4	3.2	2	1.2	2	1.8
Turkey																		
1973	17	100.0	1	3.9	9	51.8	(c)	1.8	1	4.2	4	24.3	1	3.5	(c)	2.3	(c)	1.6
1974	29	100.0	1	3.4	16	56.1	(c)	.7	2	8.5	5	18.7	1	4.2	1	3.0	(c)	.6
1975	54	100.0	3	5.0	29	54.0	(c)	.9	3	6.2	8	13.5	5	8.4	2	4.2	1	1.0
1976	64	100.0	1	1.6	26	40.1	2	2.4	3	5.0	9	14.2	10	15.5	3	4.7	1	1.0
1977	62	100.0	1	1.0	19	31.0	1	.9	3	5.5	9	14.4	12	19.3	15	23.6	1	1.6
1978	46	100.0	5	10.6	15	33.6	2	5.1	1	1.9	11	23.8	3	6.6	7	15.3	1	1.5
1979	40	100.0	2	3.8	13	31.4	(c)	0.1	5	12.8	6	15.1	4	9.5	8	19.3	(c)	0.5
India																		
1973	32	100.0	2	7.1	12	38.9	1	3.4	4	12.7	1	2.5	5	16.6	4	12.9	1	2.3
1974	37	100.0	2	5.2	17	45.4	3	7.1	6	17.3	(c)	1.1	4	10.0	3	8.4	(c)	.6
1975	53	100.0	3	5.6	24	46.2	3	4.8	7	13.1	2	3.4	6	11.1	2	3.9	1	1.3
1976	52	100.0	2	4.7	28	52.7	1	2.5	8	14.7	1	1.5	6	10.9	1	1.4	2	3.3
1977	48	100.0	4	8.8	24	49.7	1	2.1	8	15.8	(c)	.8	5	9.8	2	3.7	1	2.7
1978	70	100.0	7	9.9	32	45.6	4	5.2	14	20.6	2	3.0	6	8.0	3	4.0	(c)	.8
1979	74	100.0	5	6.1	26	34.5	8	10.9	15	20.8	3	4.4	9	12.1	5	6.9	2	2.2

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Saudi Arabia																		
1973	$ 3	100.0	$ 1	30.8	$ 1	38.5	(c)	5.8	(c)	2.1	(c)	10.5	(c)	5.3	(c)	3.8	(c)	1.4
1974	3	100.0	(c)	9.5	1	43.5	(c)	2.0	(c)	3.0	(c)	14.4	$ 1	17.5	(c)	5.6	(c)	.3
1975	12	100.0	2	16.5	4	38.0	(c)	1.1	(c)	3.8	$ 1	9.9	2	16.2	$ 1	6.6	(c)	3.4
1976	31	100.0	4	11.7	7	23.8	(c)	1.2	$ 1	4.2	5	16.7	5	14.6	6	19.8	$ 2	5.0
1977	45	100.0	8	16.9	15	34.1	$ 1	1.8	2	5.1	7	14.9	2	4.1	9	19.9	1	1.2
1978	33	100.0	9	27.1	8	25.2	3	9.2	2	5.2	6	18.3	2	6.8	1	4.5	(c)	1.3
1979	47	100.0	15	32.7	11	22.5	8	16.3	1	1.8	6	13.5	2	3.9	3	5.6	1	1.2
China																		
1973	19	100.0	—	—	3	16.8	9	45.2	4	23.8	1	4.7	1	3.1	1	6.0	(c)	(d)
1974	50	100.0	—	—	12	24.8	18	36.9	12	24.4	4	7.8	1	1.8	2	3.3	(c)	.4
1975	74	100.0	5	6.4	24	32.1	21	28.5	14	18.7	4	5.9	3	3.5	(c)	.4	1	1.5
1976	61	100.0	2	3.5	15	24.5	22	36.9	15	24.6	3	5.5	2	3.4	1	1.1	(c)	(d)
1977	39	100.0	4	8.9	14	35.6	3	8.4	15	38.4	(c)	.6	(c)	.2	3	6.6	(c)	(d)
1978	68	100.0	6	8.8	20	29.5	15	22.3	12	18.2	1	1.7	2	2.8	6	8.5	2	2.8
1979	112	100.0	9	8.3	34	30.7	30	27.0	24	21.1	4	4.0	3	2.4	1	1.1	2	2.2
Argentina																		
1973	22	100.0	4	19.5	9	40.4	4	18.2	1	2.6	2	6.9	2	9.2	(c)	1.9	(c)	.1
1974	26	100.0	3	13.3	12	45.4	3	.6	3	10.2	3	11.5	2	6.5	2	9.0	(c)	.5
1975	28	100.0	4	15.0	7	23.9	(c)	10.2	1	4.8	7	26.1	2	7.9	1	4.3	1	3.8
1976	25	100.0	4	16.9	10	38.0	3	1.0	2	8.8	6	23.0	1	3.2	1	5.0	(c)	1.3
1977	30	100.0	3	10.8	9	31.1	1	1.7	5	15.3	7	21.7	2	5.2	3	9.0	(c)	1.5
1978	78	100.0	11	14.3	33	41.6	1	1.0	6	8.2	16	20.5	5	5.9	4	5.8	1	1.2
1979	64	100.0	9	13.4	24	37.6	2	3.0	9	13.6	10	14.9	3	4.1	7	10.4	1	1.7
Eastern Europe																		
U.S.S.R.																		
1973	366	100.0	32	8.8	168	46.0	42	11.6	37	10.2	24	6.7	22	5.9	20	5.4	8	2.1
1974	449	100.0	68	15.2	185	41.2	39	8.6	46	10.2	40	8.9	9	1.9	32	7.1	9	2.1
1975	553	100.0	92	16.6	224	40.5	29	5.2	66	11.9	44	7.9	13	2.3	53	9.5	13	2.4
1976	577	100.0	48	8.3	307	53.2	24	4.1	80	13.8	39	6.7	13	2.3	25	4.3	15	2.5
1977	649	100.0	31	4.8	320	49.2	80	12.4	80	12.4	43	6.6	9	1.3	21	3.2	15	2.3
1978	637	100.0	17	2.6	301	47.3	78	12.3	71	11.1	77	12.0	9	1.3	42	6.7	5	.8
1979	635	100.0	7	1.1	315	49.6	47	7.3	73	11.5	78	12.3	18	2.8	58	9.1	11	1.7

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country: United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Poland																		
1973	$103	100.0	$ 3	2.6	$46	44.3	$ 8	7.7	$ 8	8.1	$12	11.8	$ 8	7.5	$ 5	5.3	$5	4.9
1974	154	100.0	3	2.1	61	39.7	4	2.4	20	13.1	25	16.4	8	5.2	11	7.2	8	4.9
1975	167	100.0	8	4.7	42	25.2	2	1.0	27	16.3	21	12.5	24	14.2	19	11.7	6	3.5
1976	205	100.0	13	6.6	56	27.3	17	8.5	26	12.8	15	7.2	15	7.5	35	17.3	8	3.8
1977	203	100.0	8	4.0	54	26.8	41	20.1	25	12.4	21	10.1	21	10.4	12	5.7	6	3.1
1978	264	100.0	25	9.4	81	30.8	26	9.9	27	10.4	22	8.4	52	19.8	10	3.6	7	2.6
1979	187	100.0	3	1.8	56	30.1	40	21.4	17	9.2	16	8.4	34	18.0	8	4.4	3	1.9
Rumania																		
1973	75	100.0	1	.7	28	36.9	10	13.9	13	16.8	8	11.0	3	4.0	7	9.8	1	1.1
1974	51	100.0	(c)	.8	28	53.9	2	3.1	8	14.7	6	11.9	2	4.1	3	5.1	2	4.7
1975	73	100.0	2	3.2	34	46.1	2	2.5	14	19.4	7	9.3	6	7.6	3	4.0	4	6.1
1976	74	100.0	2	2.2	34	46.2	3	4.2	6	8.4	14	18.6	2	2.2	6	8.1	3	7.4
1977	140	100.0	5	3.4	57	40.7	26	18.8	14	10.1	13	9.1	4	3.1	10	6.9	2	1.2
1978	267	100.0	21	8.0	73	27.1	50	18.8	17	6.3	37	13.7	7	2.5	56	20.9	2	.6
1979	243	100.0	7	2.7	58	24.1	23	9.4	17	7.1	52	21.5	6	2.3	72	29.7	2	1.0
Yugoslavia																		
1973	52	100.0	3	6.2	31	59.2	(c)	6.6	3	12.6	7	4.6	2	8.8	5	.4	(c)	.6
1974	47	100.0	1	2.0	28	60.0	(c)	13.6	6	13.7	6	1.4	1	5.3	2	.7	(c)	1.2
1975	85	100.0	2	1.8	53	61.9	(c)	(d)	9	10.5	9	11.1	1	1.3	8	9.8	1	.6
1976	68	100.0	2	3.2	39	57.6	NA	NA	11	16.4	6	8.1	2	2.9	5	7.1	2	2.6
1977	87	100.0	2	1.8	57	65.7	NA	NA	11	13.0	8	9.6	3	3.5	3	3.4	1	1.5
1978	143	100.0	5	3.6	83	58.4	(c)	(d)	22	15.5	15	10.3	5	3.3	6	4.5	3	2.4
1979	186	100.0	5	2.7	98	52.5	8	4.2	22	11.9	24	12.9	2	1.2	14	7.5	1	.5
Czechoslovakia																		
1973	28	100.0	(c)	.3	17	61.3	(c)	.9	6	22.0	2	5.9	(c)	1.6	1	4.1	(c)	.8
1974	33	100.0	(c)	.2	20	59.6	(c)	.1	8	24.2	1	3.0	1	2.2	1	3.7	1	1.7
1975	51	100.0	(c)	(d)	30	59.2	(c)	.6	7	13.9	2	4.2	1	1.6	2	4.6	1	1.9
1976	57	100.0	(c)	.8	26	44.9	(c)	.2	11	18.8	2	4.2	4	6.4	8	14.5	1	1.1
1977	53	100.0	(c)	.9	34	63.5	2	3.0	8	15.2	3	5.4	1	2.7	1	1.3	(c)	.3
1978	75	100.0	(c)	.3	49	64.3	—	—	12	15.8	6	7.3	2	2.0	2	3.1	1	.7
1979	82	100.0	(c)	.1	54	65.8	1	.6	17	20.6	3	4.0	1	1.2	1	1.7	3	3.2

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Hungary																		
1973	$ 8	100.0	(c)	.7	$ 4	48.2	—	0.0	$2	18.8	(c)	4.1	$1	13.2	$1	8.4	(c)	.7
1974	12	100.0	(c)	.2	7	53.5	$1	5.6	2	20.3	(c)	2.3	(c)	3.2	1	4.5	(c)	.8
1975	15	100.0	(c)	.4	9	57.8	(c)	(d)	3	22.4	$1	9.4	(c)	2.7	1	4.4	(c)	1.6
1976	27	100.0	(c)	.6	13	48.4	(c)	.1	5	19.2	5	18.5	(c)	1.4	1	2.9	$1	4.4
1977	50	100.0	$2	3.4	32	63.6	3	7.0	5	10.4	1	2.0	1	1.7	1	1.9	1	1.6
1978	48	100.0	(c)	.4	26	55.3	1	1.9	7	15.3	4	9.2	1	1.4	2	5.0	1	2.2
1979	62	100.0	1	1.8	44	71.0	(c)	(d)	6	9.1	3	4.3	4	6.5	2	3.1	1	1.5

NA - Not Available.

(a) Re-exported items are included; therefore these figures are inconsistent with other Handbook data.

(b) Percent of Total is proportion of Total Exports from 14 Major Producers. The 14 countries are: United States, Austria, Belgium, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland and the United Kingdom.

(c) Less than $500,000.

(d) Less than .05%.

Source: U.S. Dept. of Commerce, "Market Share Reports", Commodity Series, Machine Tools for Working Metals.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1980

(Thousands of U.S. Dollars)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL CUTTING						
01 For fissionable material, NC	$ 5	$ —	$ —	$ 4	$ 1	$ —
03 For fissionable material, not NC	9	4	—	—	5	—
05 Electro erosion, electric, ultrasonic, NC	28,625	14,377	4,673	4,101	2,173	2,407
07 Electro erosion, electric, ultrasonic, not NC	24,242	3,904	6,636	9,974	1,358	1,612
12 Center and copying multiple tool lathes, NC	62,913	22,184	11,950	2,956	14,634	9,096
14 Automatic and turret lathes, NC	65,309	19,082	7,441	5,193	8,935	21,823
16 Automatic and revolving lathes, not parallel, multiple tool, NC	40,985	8,640	9,002	5,026	2,231	14,463
22 Center and copying lathes, multiple tool, not NC	50,423	19,080	9,394	5,357	5,725	9,417
24 Automatic and turret lathes, not NC	72,585	17,172	16,481	17,349	4,105	16,169
26 Automatic and turret lathes, not parallel, multiple tool, not NC	37,919	11,594	11,068	5,964	6,440	—
36 Boring-milling machines, horizontal, NC	47,711	17,806	6,256	3,223	11,276	6,916
37 Boring machines, not boring-milling, NC	10,648	1,951	2,045	1,046	1,601	3,470
38 Boring-milling, horizontal, not NC	21,173	3,825	2,617	2,079	3,212	8,270
39 Boring machines, not boring-milling, not NC	8,478	1,601	1,674	1,989	554	2,540
41 Planing machines, NC	136	78	4	19	26	—
43 Planing machines, not [illegible]	1,347	542	121	431	189	—
44 Shaping & slotting, broaching, sawing, NC	974	120	228	383	27	164
45 Shaping & Slotting, not NC	4,180	595	511	363	459	1,969
46 Broaching machines, not NC	5,882	1,552	2,127	901	116	1,113
47 Sawing and cut-off machines, not NC	41,533	7,120	8,578	5,667	7,914	9,496
48 Milling machines, NC	50,774	10,059	15,683	3,016	8,377	12,062
49 Radial drilling machines, NC	1,217	295	474	82	141	191
51 Piercing machines, not drilling, NC	38,432	15,224	8,204	1,321	9,109	3,639
52 Milling machines, not NC	104,685	32,485	16,376	18,101	12,328	22,397
53 Radial drilling machines, not NC	10,420	3,809	1,594	1,871	1,696	1,136
54 Other drilling machines	35,120	8,736	6,904	2,493	6.062	9,063
55 Cylindrical and surface grinding machines (micrometric) NC	14,280	2,382	1,567	5,502	1,194	2,884
56 Grinding, honing, polishing, lapping (micrometric), NC	5,489	2,788	353	846	773	447
57 Surface grinding machines, plane surface (micrometric), not NC	24,593	5,114	4,959	1,628	2,760	9,057
58 Surface grinding machines, cylindrical surface (micrometric), not NC	43,688	18,236	9,055	3,007	2,308	10,505
69 Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	37,866	13,618	6,654	6,309	2,572	7,170
61 Grinding, honing, polishing, lapping, (micrometric), not NC	27,134	10,884	3,751	3,297	2,798	5,832
62 Grinding, honing, polishing, lapping (not micrometric), NC	855	94	259	188	231	—
63 Grinding, honing, polishing, lapping (not micrometric), not NC	38,562	9,139	11,423	6,541	6,656	3,927
64 Jig boring & milling machines, NC	10,823	4,890	2,424	263	2,113	642
65 Jig boring & milling machines, not NC	8,427	5,385	1,012	564	358	907
66 Gear cutting machines, cylindrical, NC	335	—	—	137	79	119
68 Gear cutting machines, cylindrical, not NC	13,379	1,342	4,420	2,142	944	4,296
69 Gear cutting machines, noncylindrical, NC	461	—	113	1	264	83
71 Gear cutting machines, noncylindrical, not NC	10,852	1,794	1,221	947	2,012	4,194
93 Screwing and tapping machines by cutting	58,993	2,797	9,069	2,438	1,958	42,411
94 Other metal cutting machines	11,334	5,257	1,513	2,622	714	1,021
Total imports, cutting (EEC)	$1,072,796	$305,555	$207,834	$135,341	$136,428	$250,908

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1980

(Thousands of U.S. Dollars)

(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 6,367	$ 1,831	$ 225	$ 1,576	$ 707	$ 1,619
75 Presses, NC, other than 8445.81, 82, 88	4,523	644	203	1,235	657	1,248
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	33,313	9,750	4,627	3,229	4,514	8,434
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83, 87, 89	7,850	3,001	1,870	1,538	633	608
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83, 87, 89	50,750	13,993	14,050	8,999	6,585	5,458
81 Rolling, bending, folding and planing machines, NC	10,487	2,687	2,045	1,043	1,599	2,170
82 Shearing, punching and stamping, NC	27,298	1,473	9,147	1,423	4,271	9,108
83 Rolling, bending, folding and planing machines, not NC	21,730	8,051	3,511	2,177	3,503	3,718
84 Rolling, bending, folding and planing, not flat products, not NC	28,583	4,820	7,171	2,252	6,953	6,091
85 Hydraulic shearing machines, not NC	18,414	6,634	2,760	357	3,246	4,770
86 Nonhydraulic shearing machines, not NC	15,855	3,173	3,892	2,085	2,906	2,565
87 Punching and stamping machines, not NC	17,912	4,827	2,863	807	4,343	3,868
88 Forging and stamping, NC	2,219	24	20	177	227	1,717
89 Forging and stamping, not NC	17,233	2,479	6,384	2,814	985	4,410
92 Forming by drawing, bars, tubes, wire etc.	10,666	1,706	2,209	2,033	1,662	2,832
95 Screwing and tapping machines not by cutting	3,980	1,324	454	502	348	1,252
96 Other metal forming machines for working flat products	7,112	1,375	1,873	749	774	1,938
97 Other machines for working wire	18,897	6,104	5,897	2,122	1,597	2,781
Total imports, forming (EEC)	$ 303,189	$ 73,896	$ 69,201	$ 35,118	$ 45,510	$ 64,587
98 MACHINE TOOLS NEC	49,684	10,583	9,502	13,896	2,289	5,257
Grand Total	$1,425,669	$390,034	$286,537	$184,355	$184,227	$320,752

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Comunities, "Foreign Trade, Vol. J. 1980".

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1980

(Thousands of U.S. Dollars)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL CUTTING						
01 For fissionable material, NC	$ 102	$ —	$ 102	$ —	$ —	$ —
03 For fissionable material, not NC	19	3	9	—	6	—
05 Electro erosion, electric, ultrasonic, NC	6,557	2,613	2,161	381	149	1,253
07 Electro erosion, electric, ultrasonic, not NC	21,549	11,375	1,869	643	158	7,334
12 Center and copying multiple tool lathes, NC	63,784	43,381	2,782	8,491	6,727	2,404
14 Automatic and turret lathes, NC	72,596	44,892	12,475	2,206	4,543	8,446
16 Automatic and revolving lathes, not parallel, multiple tool, NC	56,839	25,686	8,820	15,774	743	5,635
22 Center and copying lathes, multiple tool, not NC	94,577	29,890	10,730	12,165	5,387	36,330
24 Automatic and turret lathes, not NC	148,555	87,001	7,444	12,794	1,867	39,215
26 Automatic and turret lathes, not parallel, multiple tool, not NC	76,972	44,652	13,080	15,746	2,904	—
36 Boring-milling machines, horizontal, NC	51,738	29,599	5,579	9,154	2,447	3,960
37 Boring machines, not boring-milling, NC	12,737	4,944	531	1,697	4,136	1,421
38 Boring-milling, horizontal, not NC	29,981	11,673	2,685	5,785	307	8,717
39 Boring machines, not boring-milling, not NC	27,390	13,169	2,081	8,393	305	2,349
41 Planing machines, NC	156	—	6	103	46	—
43 Planing machines, not NC	4,439	3,087	106	584	50	531
44 Shaping & slotting, broaching, sawing, NC	1,113	472	147	246	241	—
45 Shaping & Slotting, not NC	5,272	2,723	300	977	141	1,100
46 Broaching machines, not NC	17,442	9,453	387	3,293	29	4,278
47 Sawing and cut-off machines, not NC	71,859	41,421	7,830	15,477	2,165	4,608
48 Milling machines, NC	75,507	40,870	10,523	15,157	838	7,925
49 Radial drilling machines, NC	2,230	196	249	1,393	7	384
51 Piercing machines, not drilling, NC	31,943	9,729	355	15,518	5,540	758
52 Milling machines, not NC	206,278	100,532	33,106	27,904	3,458	40,778
53 Radial drilling machines, not NC	9,126	1,961	593	4,091	310	2,139
54 Other drilling machines	46,657	15,606	6,070	8,284	2,122	12,796
55 Cylindrical and surface grinding machines (micrometric) NC	17,362	7,577	3,559	5,319	68	763
56 Grinding, honing, polishing, lapping (micrometric), NC	6,497	4,713	2	549	120	1,100
57 Surface grinding machines, plane surface (micrometric), not NC	78,587	48,030	2,188	8,749	610	14,932
58 Surface grinding machines, cylindrical surface (micrometric), not NC	71,685	40,663	3,272	2,246	394	20,780
59 Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	73,534	26,227	10,713	23,642	4,153	8,537
61 Grinding, honing, polishing, lapping, (micrometric), not NC	83,107	64,303	3,738	8,166	437	6,148
62 Grinding, honing, polishing, lapping (not micrometric), NC	702	366	90	91	1	—
63 Grinding, honing, polishing, lapping (not micrometric), not NC	59,464	27,241	9,231	13,814	4,528	2,664
64 Jig boring & milling machines, NC	18,162	3,656	939	13,200	60	306
65 Jig boring & milling machines, not NC	7,594	1,794	96	835	216	4,618
66 Gearcutting machines, cylindrical, NC	196	—	—	129	68	—
68 Gear cutting machines, cylindrical, not NC	35,849	27,013	929	122	127	7,656
69 Gear cutting machines, noncylindrical, NC	938	156	18	223	541	—
71 Gear cutting machines, noncylindrical, not NC	28,865	23,000	223	1,228	2,957	1,431
93 Screwing and tapping machines by cutting	20,929	8,224	2,887	1,445	1,263	3,241
94 Other metal cutting machines	211,472	155,111	9,633	32,189	98	14,313
Total exports, cutting (EEC)	$1,850,361	$1,013,002	$177,538	$298,203	$60,267	$278,850

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1980

(Thousands of U.S. Dollars)

(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 6,839	$ 3,206	$ 1,255	$ 1,301	$ 443	$ 181
75 Presses, NC, other than 8445.81, 82, 88	5,907	3,122	13	1,832	86	832
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	94,713	58.994	6,958	4,128	8,023	12,835
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83, 87, 89	32,476	[illegible]	443	672	4,058	600
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83, 87, 89	104,467	53,568	13,121	26,297	6,036	4,872
81 Rolling, bending, folding and planing machines, NC	7,358	2,753	1,015	1,618	850	655
82 Shearing, punching and stamping, NC	31,631	24,663	1,283	2,266	1,457	1,785
83 Rolling, bending, folding and planing machines, not NC	51,827	27,226	2,912	9,293	5,039	4,110
84 Rolling, bending, folding and planing, not flat products, not NC	66,022	21,672	13,411	12,382	11,414	6,348
85 Hydraulic shearing machines, not NC	36,952	17,168	6,575	761	7,458	2,703
86 Nonhydraulic shearing machines, not NC	42,204	22,718	4,515	8,780	1,219	4,289
87 Punching and stamping machines, not NC	15,708	8,542	1,899	1,446	1,803	1,620
88 Forging and stamping, NC	4,349	4,273	14	33	5	—
89 Forging and stamping, not NC	35,880	25,626	939	1,763	485	6,791
92 Forming by drawing, bars, tubes, wire etc.	38,847	24,380	388	6,700	468	6,776
95 Screwing and tapping machines not by cutting	5,881	4,694	105	361	345	266
96 Other metal forming machines for working flat products	23,684	18,196	3,034	701	297	1,288
97 Other machines for working wire	50,701	32,877	6,515	4,227	2,387	4,631
Total exports, forming (EEC)	$ 655,446	$ 380,379	$ 64,395	$ 84,561	$ 51,873	$ 60,582
98 MACHINE TOOLS NEC	120,645	24,874	24,855	55,725	5,865	8,738
Grand Total	$2,626,452	$1,418,255	$266,788	$438,489	$118,005	$348,170

(a) Belgium, Luxembourg, Netherlands.

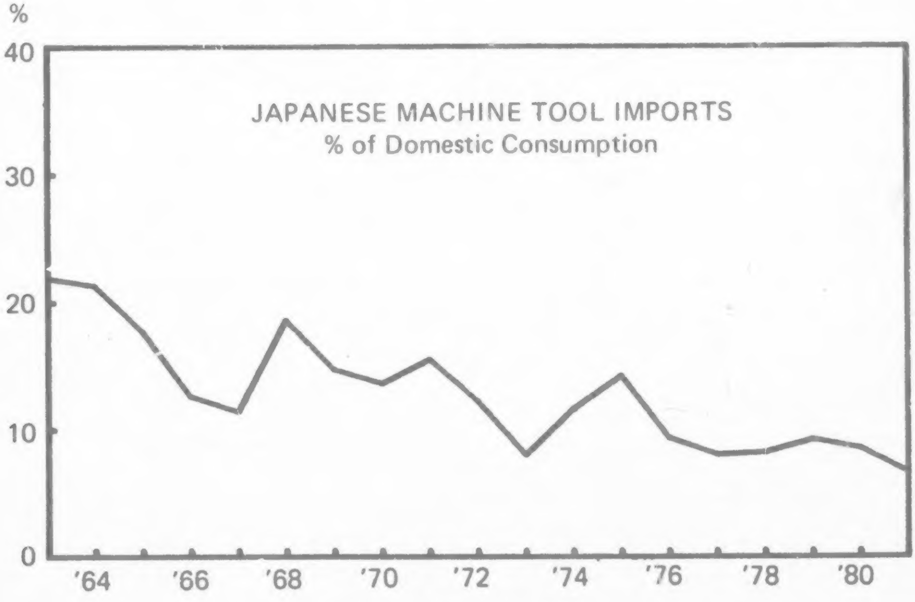
Source: Statistical Office of the European Comunities, "Foreign Trade, Vol. J. 1980."

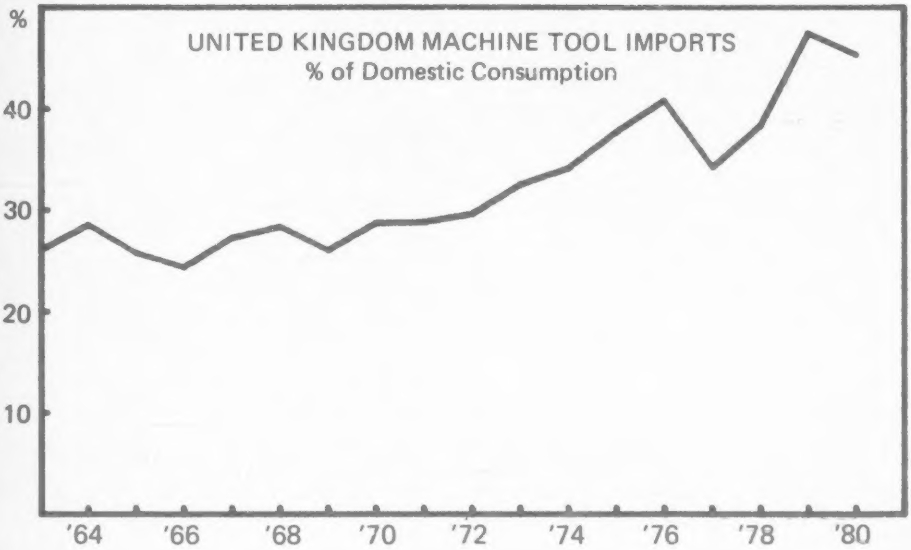
MACHINE TOOL IMPORTS AS A PERCENT OF DOMESTIC MACHINE TOOL CONSUMPTION, 1963 TO DATE

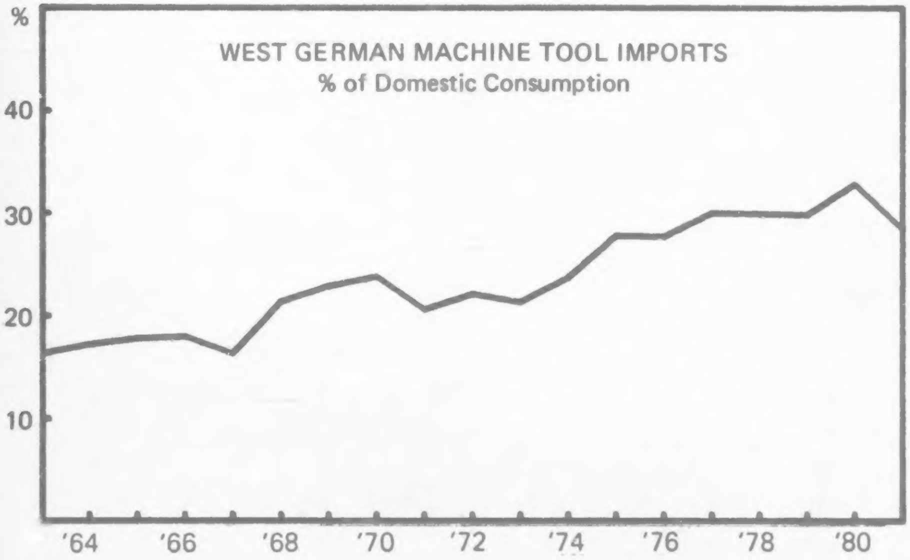
(Percent)

Year	U.S.A.	Japan	United Kingdom	West Germany
1963	5.2%	21.9%	26.0%	16.3%
1964	3.5	21.3	28.5	17.2
1965	4.2	17.7	25.7	17.8
1966	7.1	12.6	24.3	18.0
1967	9.6	11.4	27.2	16.3
1968	9.6	18.6	28.3	21.4
1969	9.4	14.7	26.0	22.9
1970	9.1	13.6	28.7	23.8
1971	9.4	15.5	28.8	20.6
1972	9.4	12.2	29.6	22.1
1973	9.7	8.0	32.5	21.3
1974	12.7	11.6	34.1	23.7
1975	13.8	14.2	37.7	27.8
1976	14.9	9.3	40.8	27.7
1977	15.6	8.0	34.2	30.0
1978	21.4	8.2	38.3	29.9
1979	22.1	9.2	47.4	29.8
1980	23.2	8.5	45.3	32.8
1981	24.2	6.6	NA	28.4

Source: National Machine Tool Builders' Association and respective machine tool trade associations.




UNITED KINGDOM MACHINE TOOL IMPORTS
% of Domestic Consumption
%
40
30
20
10
'64
'66
'68
'70
'72
'74
'76
'78
'80

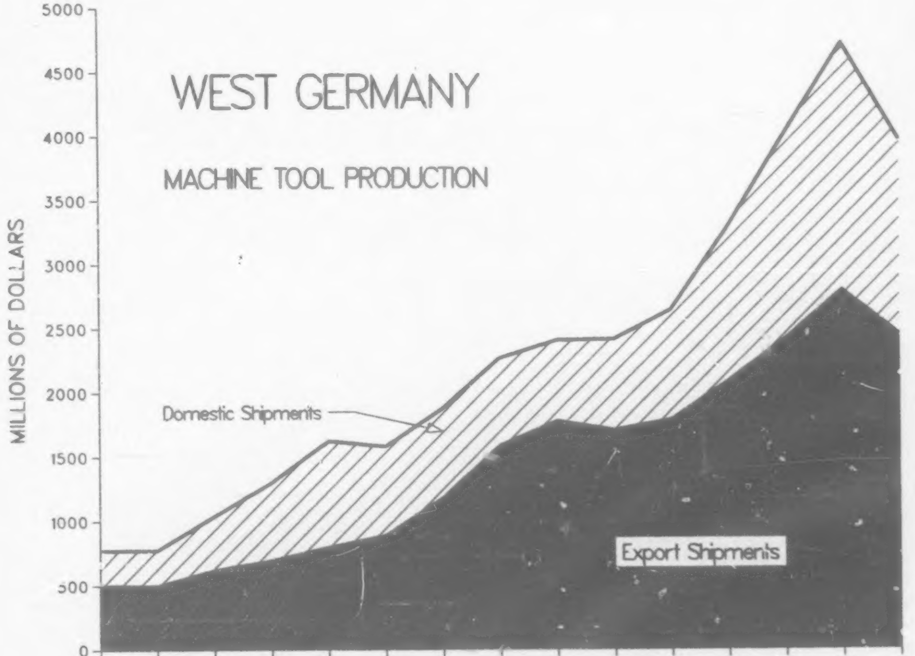

WEST GERMAN MACHINE TOOL IMPORTS
% of Domestic Consumption
%
40
30
20
10
'64
'66
'68
'70
'72
'74
'76
'78
'80

THE GERMAN MACHINE TOOL INDUSTRY (a)
1963 to Date

Year	Employees (Year-End)	Per Cent of Production Exported	Imports as Per Cent of Exports	Production Per Employee
		Per Cent of Value		U.S. $
1963	106,000	53.5%	16.9%	$ 6,666
1964	110,000	51.5	19.6	6,856
1965	115,000	47.3	24.2	7,564
1966	112,500	54.9	18.0	7,800
1967	108,000	62.9	11.5	7,943
1968	110,000	68.3	12.6	8,069
1969	120,000	59.1	20.6	9,869
1971	120,000	49.3	26.7	15,370
1972	113,000	55.7	21.2	15,896
1973	112,000	61.3	15.8	19,403
1974	111,500	69.0	12.8	23,411
1975	102,000	72.7	13.0	26,973
1976	96,500	70.2	9.5	28,521
1977	99,000	69.7	18.7	31,456
1978	98,700	65.0	22.9	38,723
1979	100,000	61.9	26.1	46,909
1980	99,000	62.6	29.2	54,937
1981	99,000	65.6	26.0	45,911

(a) Figures include parts.

Sources: VDMA, "Statistisches Handbuch für den Maschinenbau", annually, "Die Lage des Maschinenbaues im Jahre," annually, and official foreign trade statistics.



GERMAN PRODUCTION OF MACHINE TOOLS
1978 to Date
(Values in Thousands of U.S. Dollars)

Machine Classifications	1978		1979		1980		1981	
	Units	Value	Units	Value	Units	Value	Units	Value
GRAND TOTAL	229,958	$3,822,923	223,337	$4,690,942	233,831	$5,438,742	216,778	$4,545,215
Metal Cutting Total	138,122	2,600,724	121,628	3,202,474	138,655	3,770,976	121,471	3,145,718
Planing, Shaping and Broaching	2,355	56,352	2,420	53,320	886	45,317	896	52,257
Lathes	10,539	336,697	9,238	405,187	10,320	419,965	9,969	366,585
Turret Lathes, Automatic	4,245	320,520	4,430	381,915	4,562	465,188	3,801	380,690
Boring and Drilling	22,972	144,441	20,777	168,839	21,387	200,751	18,916	132,359
Milling Machines, Horizontal Boring and Milling Machines	8,643	330,337	8,446	422,049	9,115	551,649	8,568	503,112
Saws and Filing Machines	21,161	82,720	20,060	110,021	20,575	127,556	18,312	103,284
Grinding, Honing and Polishing	53,483	413,316	41,714	499,101	55,912	570,244	45,998	478,880
Gear Cutting Machines	1,397	127,581	1,106	138,983	1,240	159,065	1,337	142,610
Other Metal Cutting Machine Tools	13,327	443,102	13,437	591,901	14,658	766,381	13,674	614,377
Parts and Accessories	—	343,659	—	431,158	—	464,861	—	371,566
Metal Forming Total	91,836	1,222,199	101,709	1,488,468	95,176	1,667,766	95,307	1,399,498
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	7,273	108,262	9,970	145,583	6,764	167,908	5,882	150,042
Mechanical Presses	11,797	187,490	10,302	235,960	9,018	295,522	8,203	252,339
Hydraulic Presses	2,755	214,496	2,484	262,853	2,466	268,862	2,095	215,548
Sheet Metalworking Machines, Including Shears	60,537	252,200	70,341	273,319	67,334	311,890	70,999	292,365
Wire Working Machines	8,649	186,932	7,675	225,043	8,670	253,970	7,171	211,965
Bolt, Screw and Nut Making Machines	825	73,160	937	94,020	924	102,754	957	57,010
Parts and Accessories	—	199,658	—	251,690	—	266,859	—	220,227

Notes: German Federal Republic includes West Berlin. Totals include some unclassified items.

Exchange Rate: 1978 $1 = 2.009 Deutsche Mark; 1979 $1 = 1.83 Deutsche Mark: 1980 $1 = 1.818 Deutsche Mark, 1981 $1 = 2.260 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Fachgemeinschaft Werkzeugmaschinen, from official foreign trade statistics.

Detailed statistics supplied by individual countries may differ in value figures from those given in the International Statistics on Machine Tools. Problems in the conversion of national currencies into dollars and differing reporting practices probably account for most of the discrepancies.

GERMAN EXPORTS OF MACHINE TOOLS
1979 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1979		1980		1981	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	179,496	$2,904,528	183,649	$3,401,935	201,518	$2,982,722
Metal Cutting Total	148,540	1,856,081	152,384	2,177,178	169,747	1,888,900
Planing, Shaping and Broaching	577	27,416	494	29,509	485	25,710
Lathes	3,499	255,792	3,463	277,621	3,535	231,366
Turret Lathes, Automatic	3,560	229,870	3,729	254,975	3,198	215,613
Boring and Drilling	6,087	112,730	5,988	98,701	7,308	82,764
Milling Machines, Horizontal Boring and Milling Machines	6,639	285,477	6,349	353,143	6,774	320,734
Saws and Filing Machines	13,464	73,620	15,021	80,968	15,387	69,137
Grinding, Honing and Polishing	109,692	370,546	111,291	423,600	126,983	358,304
Gear Cutting Machines	728	76,688	943	96,985	867	82,243
Other Metal Cutting Machine Tools	4,294	221,088	5,106	342,965	5,210	298,649
Parts and Accessories	—	202,836	—	218,711	—	204,379
Metal Forming Total	28,710	978,105	29,085	1,017,529	29,278	925,524
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	2,593	105,927	2,699	117,751	3,523	97,775
Mechanical Presses	3,636	123,520	3,226	109,482	3,001	163,621
Hydraulic Presses	1,243	99,307	1,550	114,980	1,796	67,457
Sheet Metalworking Machines, Including Shears	11,333	201,064	11,380	217,454	10,241	188,273
Wire Working Machines	5,231	158,088	4,619	165,392	5,103	150,044
Bolt, Screw and Nut Making Machines	699	74,289	617	65,955	673	48,083
Other Metal Forming Machine Tools	3,975	52,912	4,994	48,086	4,941	48,995
Parts and Accessories	—	162,998	—	178,429	—	161,277
Other Metal Working Machines (including Parts and Accessories)	2,246	70,342	2,180	207,228	2,493	168,299

Exchange rate: 1979 $1 = 1.833 Deutsche Mark; 1980 $1 = 1.818 Deutsche Mark; 1981 $1 = 2.260 Deutsche Mark.

Note: Individual items may not add to total due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN IMPORTS OF MACHINE TOOLS
1979 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1979		1980		1981	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	131,862	$756,854	122,711	$993,994	76,724	$774,776
Metal Cutting Total	116,826	511,044	101,202	675,184	58,159	519,960
Planing, Shaping and Broaching	250	2,862	279	5,348	153	1,264
Lathes	6,608	86,381	9,994	118,888	8,692	87,114
Turret Lathes, Automatic	1,438	51,888	1,595	70,162	1,040	42,376
Boring and Drilling	21,212	54,048	20,380	81,152	7,467	58,249
Milling Machines, Horizontal Boring and Milling Machines	5,086	104,571	5,791	123,894	4,586	115,373
Saws and Filing Machines	6,754	11,134	7,619	13,996	9,723	11,722
Grinding, Honing and Polishing	71,881	86,260	51,563	120,352	23,643	88,740
Gear Gutting Machines	94	8,106	124	12,757	114	8,847
Other Metal Cutting Machine Tools	3,503	40,992	3,857	44,218	2,741	35,600
Parts and Accessories	—	64,802	—	84,417	—	70,675
Metal Forming Total	14,277	220,085	16,866	273,067	14,992	219,450
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	1,834	12,311	2,528	14,260	2,343	20,338
Mechanical Presses	1,798	40,562	2,527	28,325	2,105	15,514
Hydraulic Presses	1,600	12,120	1,309	20,954	1,610	14,274
Sheet Metalworking Machines, Including Shears	2,915	35,912	4,103	50,968	3,732	39,720
Wire Working Machines	1,939	31,894	2,322	40,853	2,028	29,454
Bolt, Screw and Nut Making Machines	296	11,731	327	9,796	295	10.938
Other Metal Forming Machine Tools	3,895	14,291	3,750	20,459	2,879	18,302
Parts and Accessories	—	61,264	—	87,452	—	70,909
Other Metal Working Machines (including Parts and Accessories)	759	25,726	4,643	45,743	3,573	35,365

Exchange rate: 1979 $1 = 1.833 Deutsche Mark; 1980 $1 = 1.818 Deutsche Mark; 1981 $1 = 2.260 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN EXPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine & By Destination, 1981

(Thousands of Dollars)

Destination	Total (a)	Boring & Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes N/C	Other Lathes	Milling Machines	Saws, Filing Machines	Other Metal Cutting
TOTAL	$1,684,520	$ 82,764	$ 82,243	$358,304	$215,613	$231,366	$320,734	$ 69,137	$324,359
Western Europe									
Austria	203,734	5,894	11,133	34,317	17,219	14,210	15,876	2,187	102,900
Belgium-Luxembourg	43,158	2,592	768	5,304	2,805	6,466	9,927	3,135	12,160
Denmark	10,235	617	—	3,374	1,615	950	1,495	1,131	1,052
France	151,398	6,695	13,274	25,652	22,773	12,544	26,537	7,829	36,094
Italy	73,706	2,309	5,497	16,517	12,882	8,794	10,500	5,904	11,304
Netherlands	35,950	3,083	353	7,486	5,035	4,923	9,843	2,591	2,635
Norway	10,114	218	39	1,903	1,970	1,297	1,730	2,105	851
Portugal	8,572	638	331	2,580	393	1,624	1,597	465	945
Spain	26,950	742	189	7,951	6,944	2,548	2,745	417	5,414
Sweden	56,561	3,710	1,761	11,067	9,026	7,155	7,480	4,482	11,881
Switzerland	63,234	6,104	2,292	14,989	11,589	8,712	3,618	3,872	12,057
United Kingdom	88,879	4,717	1,860	15,249	12,913	18,769	17,507	4,562	13,302
Other Western Europe	46,896	1,954	104	9,164	4,341	4,464	21,051	2,848	2,971
Eastern Europe									
Bulgaria	14,577	1,962	385	3,447	476	1,004	5,482	211	1,611
Czechoslovakia	20,863	1,073	1,762	9,842	1,310	338	1,762	1,585	3,192
Hungary	11,715	821	576	3,135	278	1,214	3,429	670	1,592
Poland	43,985	4,697	138	8,100	6,590	4,634	15,490	89	4,247
Rumania	11,348	—	959	5,201	152	841	3,294	21	880
U.S.S.R.	191,700	10,900	5,089	22,037	25,056	47,628	67,719	3,017	10,256
Yugoslavia	37,384	1,129	2,410	7,295	7,600	6,082	4,500	511	7,857
North & Central America									
Canada	18,924	507	95	3,838	1,405	8,547	1,866	1,063	1,603
Mexico	34,550	2,251	1,655	4,437	8,778	2,073	3,485	1,335	10,537
United States	140,997	2,656	17,065	42,517	21,889	14,605	23,194	5,533	13,539
Other N/C America	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
South America									
Argentina	11,414	754	342	2,707	700	2,931	1,550	771	1,659
Brazil	45,688	1,272	1,798	12,667	7,134	9,899	8,677	177	4,065
Chile	969	19	—	413	—	223	206	43	66
Venezuela	1,692	43	173	666	—	423	158	134	95
Other So. America	3,815	102	—	1,897	1	547	506	299	464
Asia									
India	39,790	1,496	1,075	9,186	4,444	13,642	7,582	923	1,442
Indonesia	9,327	374	—	1,453	114	1,009	5,804	381	192
Iran	3,371	681	—	696	482	40	846	115	512
Israel	4,292	188	1	357	1,014	113	1,719	211	689
Japan	59,042	—	6,668	22,677	1,569	192	5,329	2,281	20,325
People's Republic of China	4,647	942	—	2,136	423	533	569	44	—
Singapore	7,800	115	—	2,313	2,097	1,285	1,097	429	465
South Korea	9,631	987	206	3,494	317	204	3,854	162	405
Other Asia	44,005	1,193	1,197	14,040	5,376	7,865	6,900	1,894	5,538
Other									
Australia & Oceania	12,530	227	799	2,469	2,200	853	881	1,519	3,581
Republic of South Africa	60,215	8,040	2,138	9,232	5,631	9,170	12,349	2,903	10,752
Other Africa	20,858	1,065	111	6,499	1,070	3,012	2,581	1,290	5,231

Exchange Rate: $1 = 2.260 Deutsche Mark.

(a) Excludes parts.
(b) Included in "Other So. America".

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN EXPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine & By Destination, 1981

(Thousands of U.S. Dollars)

Country of Destination	Total (a)	Hammers, Forging & Riveting, Bending, & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
Grand Total	$764,248	$97,775	$163,621	$67,457	$188,273	$150,044	$48,083	$48,995
Western Europe								
Austria	33,303	7,944	2,657	2,782	7,744	5,689	2,653	3,834
Belgium-Luxembourg	12,557	1,480	922	1,064	3,700	3,769	481	1,142
Denmark	5,372	664	1,215	901	1,747	418	50	376
France	64,608	5,753	9,283	5,072	16,336	13,757	6,680	7,726
Italy	35,280	5,396	2,763	6,004	10,056	6,487	2,255	2,318
Netherlands	19,225	1,636	2,779	1,750	7,683	3,591	143	1,643
Norway	5,822	911	112	208	2,241	1,916	57	377
Portugal	4,130	347	158	5	892	1,639	958	131
Spain	90,741	630	80,466	1,170	5,048	2,546	503	378
Sweden	32,119	13,835	1,158	998	10,342	3,632	1,075	1,079
Switzerland	32,035	2,008	4,550	4,919	9,997	7,046	1,832	1,682
United Kingdom	43,744	4,286	15,081	3,999	10,675	5,009	1,595	3,100
Other Western Europe	25,191	2,006	2,249	3,876	7,108	7,812	669	1,471
Eastern Europe								
Bulgaria	10,476	1,037	358	2,348	5,118	1,265	260	90
Czechoslovakia	9,315	4,072	278	70	3,204	1,109	24	557
Hungary	4,623	161	432	260	2,988	618	38	126
Poland	11,823	3,865	2,469	588	1,415	2,117	139	1,231
Rumania	6,372	4,425	—	1,681	115	151	—	—
U.S.S.R.	52,342	1,836	2,705	4,261	24,517	5,153	6,226	7,644
Yugoslavia	16,796	1,813	3,333	1,937	4,163	4,142	766	642
North & Central America								
Canada	9,061	995	315	10	1,346	1,764	4,129	501
Mexico	17,142	3,066	3,442	1,804	2,782	4,938	544	564
U.S.A.	54,784	6,275	3,431	3,977	13,318	15,586	8,910	3,286
Other N/C America	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
South America								
Argentina	10,942	2,199	285	841	4,131	3,007	110	368
Brazil	11,979	1,715	1,566	159	5,478	2,091	219	750
Chile	485	19	118	10	101	208	5	25
Venezuela	2,342	114	131	103	144	1,166	—	682
Other So. America	4,848	321	421	274	973	2,642.	19	197
Asia								
India	7,031	821	1,340	899	872	1,776	979	343
Indonesia	6,046	30	841	2,860	608	829	187	692
Iran	3,511	32	1,250	182	273	1,750	—	24
Israel	1,330	140	200	1	73	721	40	154
Japan	13,183	3,702	513	533	1,959	2,437	3,093	946
P.R. China	8,914	6,058	1,269	97	1,267	222	—	—
Singapore	6,084	124	873	2,898	712	866	159	451
South Korea	3,015	100	576	96	443	1,509	281	8
Other Asia	27,184	2,945	3,403	3,513	6,812	8,832	147	1,532
Other								
Australia & Oceania	7,992	1,010	191	395	1,502	3,958	337	600
Republic of South Africa	23,404	2,903	4,233	2,242	4,173	6,895	1,677	1,281
Other Africa	29,097	1,098	6,254	2,666	6,214	10,979	842	1,043

Exchange Rate: $1 = 2.260 Deutsche Mark.

(a) Includes other metalworking machines.
(b) Included in "Other So. America".

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine & By Destination, 1981
(Thousands of Dollars)

Origin	Total (a)	Boring & Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes N/C	Other Lathes	Milling Machines	Saws, Filing Machines	Other Metal Cutting
Grand Total	$449,265	$ 58,249	$ 8,847	$ 88,740	$ 42,376	$ 87,114	$115,373	$ 11,722	$ 36,864
Europe									
Austria	21,620	528	30	6,586	893	9,435	3,420	635	94
Belgium	16,449	2,796	35	583	556	5,221	6,873	57	328
Czechoslovakia	7,264	751	71	532	105	1,403	4,362	—	40
Denmark	2,279	123	—	1,355	28	311	195	60	207
France	25,394	1,845	187	4,162	4,015	2,826	9,748	950	1,660
Hungary	9,850	2,773	4	901	729	3,921	1,523	—	—
Italy	51,552	7,163	969	10,814	5,082	10,377	13,869	1,573	1,704
Netherlands	5,329	546	18	1,824	165	542	1,646	332	256
Poland	3,100	187	—	255	716	1,058	771	113	—
Rumania	2,828	115	—	423	—	1,547	734	—	8
Spain	15,671	1,207	106	1,554	609	2,302	8,824	741	328
Sweden	12,785	1,073	22	6,675	1,089	1,508	1,322	700	396
Switzerland	125,548	17,150	2,418	38,145	10,222	10,991	25,979	1,470	19,174
United Kingdom	25,534	3,425	302	4,642	3,804	5,060	7,111	335	855
U.S.S.R.	2,706	273	42	401	167	850	952	3	17
Yugoslavia	4,062	177	—	870	1,025	59	1,931	—	—
Japan	82,277	11,892	—	1,278	11,780	24,040	20,391	3,153	9,743
U.S.A.	19,599	2,898	3,875	5,740	520	419	4,509	372	1,265
All Other Countries	15,434	3,326	769	1,999	869	5,243	1,213	1,226	789

Exchange Rate: $1 = 2.260 Deutsche Mark.

(a) Excludes parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine & By Destination, 1981

(Thousands of U.S. Dollars)

Origin	Total (a)	Hammers, Forging & Riveting, - Bending & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines	Other Metal Working Machines
Grand Total	$183,906(b)	$20,338	$15,514	$14,274	$39,720	$29,454	$10,939	$18,302	$35,365
Europe									
Austria	12,969	8,925	488	286	762	1,176	—	1,331	NA
Belgium	6,327	183	912	1,111	1,262	401	1,123	1,336	NA
Czechoslovakia	1,750	1,235	447	—	67	—	—	1	NA
Denmark	3,163	351	183	1,038	1,385	73	—	133	NA
France	15,306	1,078	950	1,545	6,385	2,870	483	1,995	NA
Hungary	358	—	73	—	—	284	—	—	NA
Italy	19,370	2,357	4,598	832	3,119	2,602	2,903	2,960	NA
Netherlands	6,769	769	295	935	3,647	385	74	663	NA
Poland	224	—	—	49	4	172	—	—	NA
Rumania	1,154	—	—	975	179	—	—	—	NA
Spain	4,400	119	731	16	423	2,591	264	256	NA
Sweden	5,049	688	384	604	1,273	1,756	45	300	NA
Switzerland	35,589	2,819	2,527	2,736	12,291	8,756	1,500	4,959	NA
United Kingdom	11,751	157	1,147	2,013	2,551	2,446	395	3,042	NA
U.S.S.R.	234	7	201	13	13	—	—	—	NA
Yugoslavia	21	13	—	—	—	8	—	—	NA
Japan	3,942	8	793	2	934	106	2,083	17	NA
U.S.A.	14,873	1,215	1,718	1,672	4,852	2,858	1,577	981	NA
All Other Countries	5,292	413	67	447	574	2,972	492	327	NA

NA - Not Available. Exchange Rate: $1 = 2.260 Deutsche Mark.

(a) Totals for individual countries exclude other metalworking machinery and exclude parts.
(b) Includes other metalworking machines.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

JAPANESE PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF METAL CUTTING MACHINE TOOLS, 1961 to Date

(Millions of U.S. Dollars)

	Production	Imports	Exports	Domestic Consumption
1961	$ 227.5	$108.1	$ 6.8	$ 328.7
1962	280.3	132.2	7.2	405.2
1963	264.3	63.3	11.9	315.7
1964	252.5	59.2	18.1	293.7
1965	195.4	38.8	24.8	209.4
1966	212.4	21.1	40.6	192.9
1967	350.1	35.7	49.0	336.8
1968	488.9	94.9	51.6	532.2
1969	666.6	95.8	60.4	702.0
1970	867.6	122.7	66.9	923.4
1971	750.5	113.6	80.1	783.2
1972	675.6	74.1	90.8	658.9
1973	1,117.0	78.3	129.3	1,066.0
1974	1,230.2	127.6	197.8	1,160.0
1975	774.9	72.7	207.6	640.0
1976	764.3	46.8	256.5	554.6
1977	1,165.1	58.5	430.1	793.5
1978	1,738.7	93.3	770.4	1,061.6
1979	2,208.9	119.6	942.8	1,385.7
1980	3,012.3	168.6	1,188.9	1,992.0
1981	3,861.4	175.1	1,409.2	2,627.3

Exchange rate: 1961-1970 $1 = 360 Yen; 1971 $1 = 350 Yen; 1972 $1 = 302 Yen; 1973 $1 = 272.5 Yen; 1974 $1 = 291.51 Yen; 1975 $1 = 296.8 Yen; 1976 $1 = 296.55 Yen; 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen.

Sources: Japan, Ministry of International Trade and Industry, and Ministry of Finance.

JAPANESE PRODUCTION, IMPORTS, AND EXPORTS OF METAL FORMING MACHINE TOOLS, 1964 to Date

(Values in Millions of U.S. Dollars)

	Production		Total Exports	Total Imports
Year	Units	Value	Value	
1964	18,339	$ 67.7	$ 5.9	$21.1
1965	15,910	72.8	6.6	12.3
1966	17,229	60.1	12.0	10.6
1967	17,571	106.2	9.1	15.4
1968	21,905	160.8	12.9	38.9
1969	23,033	195.8	18.3	39.4
1970	26,345	241.5	24.3	37.5
1971	16,466	202.0	34.3	40.6
1972	19,720	216.3	54.9	29.2
1973	27,168	360.1	86.4	31.6
1974	23,854	420.0	109.8	48.6
1975	12,447	284.8	105.6	51.3
1976	15,978	294.6	113.4	24.1
1977	16,326	438.0	186.0	27.5
1978	18,526	613.7	241.1	26.8
1979	23,995	687.1	286.6	45.0
1980	28,598	818.0	264.0	52.5
1981	27,961	9[illegible]6.8	276.3	40.4

Source: Japan Metal Forming Machinery Industry Association.

JAPANESE EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY

Number of Employees, 1964-1981

Year	Employees	Year	Employees
1964	38,626	1973	45,242
1965	37,377	1974	45,295
1966	33,719	1975	40,925
1967	35,141	1976	34,509
1968	40,092	1977	32,168
1969	44,806	1978	28,154
1970	49,161	1979	31,113
1971	50,630	1980	33,737
1972	46,738	1981	33,883

NA - Not Available.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE PRODUCTION, EXPORTS, AND IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1980 and 1981

(Values in Thousands of U.S, Dollars)

	1980			1981		
Type of Machine	Production	Exports	Imports	Production	Exports	Imports
Total						
Units	28,598	NA	NA	27,961	23,964	2,718
Value	$817,963	$263,991	$52,490	$936,843	$276,293	$40,430
Hydraulic Presses						
Units	6,772	NA	NA	6,909	2,067	155
Value	$156,445	$ 30,346	$ 5,116	$164,721	$ 26,790	$ 1,759
Mechanical Presses						
Units	13,232	NA	NA	13,352	2,060	256
Value	$466,800	$ 68,445	$ 7,114	$576,089	$ 58,323	$ 4,154
Forging Machines						
Units	563	NA	NA	466	304	24
Value	$ 28,234	$ 19,894	$ 8,101	$ 31,080	$ 22,859	$10,992
Shearing Machines						
Units	5,831	NA	NA	5,285	6,449	802
Value	$ 94,593	$ 56,150	$ 3,153	$103,047	$ 76,089	$ 5,301
Bending Machines						
Units	872	NA	NA	950	3,895	344
Value	$ 24,891	$ 35,709	$10,051	$ 24,328	$ 34,095	$ 4,176
Wire Forming Machines						
Units	1,328	NA	NA	999	166	9
Value	$ 46,999	$ (a)	$ (a)	$ 37,578	$ 6,589	$ 385
Other Metal Forming Machines						
Units	—	NA	NA	NA	9,023	1,128
Value	—	$ 53,447	$18,955	NA	$ 51,549	$13,663

NA - Not Available. Exchange rate: 1980 $1 = 226.75 Yen, 1981 $1 = 220.53 Yen.

(a) Included in all other metal forming machine category.

Source: Japan Metal Forming Machinery Industry Association.

JAPANESE PRODUCTION, EXPORTS AND IMPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine, 1981

(Values in Thousands of U.S. Dollars)

	Production		Exports		Imports	
	Units	Value	Units	Value	Units	Value
TOTAL, (incl. NC)	165,631	$3,861,429	301,567	$1,409,164	17,244	$ 175,137
Horizontal Boring Machines	500	53,607	402	38,018	24	2,499
Jig Boring Machines	999	36,965	52	5,632	15	2,725
Boring Machines, NC	135	57,298	24	6,353	5	1,392
Boring Machines, N.E.C.	1,150	10,987	789	9,377	21	1,134
Radial Drilling Machines	1,364	19,426	668	8,638	—	—
Multi-Spindle Drilling Machines	598	16,465	205	9,092	—	—
Upright Drilling Machines	1,891	8,013	310	1,242	—	—
Drilling Machines, NC	301	9,781	96	3,247	—	—
Drilling Machines, N.E.C.	30,125	20,396	7,711	5,165	1,798	3,891
Gear Hobbing Machines	611	37,142	111	4,807	100	4,104
Gear Making Machines	704	53,770	108	6,140	180	26,228
External Grinding Machines	2,204	124,972	296	16,438	92	5,854
Internal Grinding Machines	848	49,200	206	9,654	77	3,342
Surface Grinding Machines	5,010	98,794	1,284	24,128	1,093	16,293
Grinding Machines, NC	235	19,653	35	4,077	43	7,645
Grinding Machines, N,E.C.	3,486	147,200	18,526	57,589	7,263	33,687
Center Lathes	6,231	91,747	2,024	25,833	1,598	9,323
Copying Lathes	52	3,356	47	1,356	—	—
Turret Lathes	176	5,392	127	3,383	8	145
Automatic Lathes	10,929	177,885	1,294	22,559	294	6,330
Vertical Lathes	130	14,837	68	7,278	2	68
Lathes, NC	12,134	731,755	6,613	507,713	7	1,886
Lathes, N.E.C.	3,374	15,916	668	7,663	620	9,527
Knee Type Machines	5,750	89,684	721	15,363	578	3,814
Milling Machines, NC	2,381	138,430	555	40,244	11	4,013
Milling Machines, N.E.C.	3,630	109,695	728	21,553	1,275	7,473
Planing Machines	77	12,679	43	3,532	—	—
Machining Centers	7,393	749,644	4,129	431,293	—	—
Broaching Machines	294	26,427	—	—	6	2,385
Special Machines	4,265	490,151			—	—
Other NC Machines	3,347	261,080	253,727	111,794	41	4,222
All Other Metal Cutting, N.E.C.	55,307	179,082	—	—	2,093	17,159

Exchange rate: $1 = 220.53 Yen.

Sources: Japan, Ministry of International Trade and Industry and Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine, For Selected Destinations, 1981
(Values in Thousands of U.S. Dollars)

	Destination									
Type of Machine	U.S.A.	West Germany	Austria	United Kingdom	U.S.S.R	South Africa	Taiwan	Belgium	Korea	Singapore
GRAND TOTAL										
UNITS	137,009	4,395	24,152	4,387	486	4,305	9,316	2,032	1,267	6,681
VALUE	$691,099	$87,172	$56,178	$50,864	$49,581	$48,488	$46,787	$34,948	$30,821	$27,792
Boring Machines										
Units	203	4	42	1	38	8	102	—	57	84
Value	$ 20,528	$ 503	$ 4,680	$ 5	$ 4,693	$ 848	$3,759	—	$3,637	$ 843
Drilling Machines										
Units	1,427	761	165	215	37	164	561	79	124	472
Value	$ 7,831	$ 268	$ 4,589	$ 54	$ 771	$ 372	$3,079	$ 36	$2,440	$ 589
Gear Cutting & Finishing										
Units	18	0	0	4	10	1	37	0	29	8
Value	$ 1,460	—	—	$ 181	$ 589	$ 5	$1,505	—	$ 898	$ 159
Grinding Machines										
Units	3,205	283	2,098	1,276	193	150	507	109	353	902
Value	$ 27,865	$ 1,855	$ 3,505	$ 317	$16,043	$ 748	$9,672	$ 59	$6,607	$ 7,382
Lathes										
Units	4,675	575	356	399	57	431	489	198	237	203
Value	$337,151	$33,184	$21,580	$23,679	$ 5,673	$28,014	$8,421	$12,932	$7,051	$12,334
Milling Machines										
Units	859	42	268	136	24	17	210	0	74	46
Value	$ 38,253	$ 1,750	$ 5,419	$ 2,390	$ 3,859	$ 599	$5,877	—	$3,460	$ 1,206
Planing Machines										
Units	1	1	0	0	0	0	4	0	6	3
Value	$ 322	$ 5	—	—	—	—	$ 390	—	$1,492	$ 240
Machining Centers										
Units	2,180	439	90	237	79	120	41	228	12	15
Value	$221,530	$35,855	$ 9,649	$23,181	$16,769	$15,032	$5,224	$21,671	$1,510	$ 2,231
Other Metal Cutting Machines										
Units	124,441	2,290	21,133	2,119	48	3,414	7,365	1,418	375	4,948
Value	$ 36,158	$13,753	$ 6,756	$ 1,057	$ 1,193	$ 2,866	$8,860	$ 249	$3,727	$ 2,798

Exchange Rate: $1 = 220.53 Yen.

Individual items may not add to totals due to rounding.

Source: Japan, Ministry of Finance.

JAPANESE PRODUCTION OF NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1975 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1975	1976	1977	1978	1979	1980	1981
GRAND TOTAL							
Units	2,182	3,286	5,436	7,336	14,317	22,069	25,926
Value	$134,178	$171,472	$299,980	$510,463	$937,423	$1,496,512	$1,967,642
Boring Machines							
Units	42	26	37	49	52	103	135
Value	$ 6,082	$ 4,677	$ 7,024	$ 18,772	$ 17,293	$ 35,652	$ 57,298
Drilling Machines							
Units	92	108	264	230	143	249	301
Value	$ 4,427	$ 5,011	$ 12,152	$ 10,952	$ 6,055	$ 8,710	$ 9,781
Milling Machines							
Units	253	323	394	549	979	1,451	2,381
Value	$ 12,069	$ 14,787	$ 20,591	$ 39,920	$ 61,026	$ 83,215	$ 138,430
Grinding Machines							
Units	12	23	51	21	93	154	235
Value	$ 788	$ 2,657	$ 3,169	$ 2,523	$ 7,401	$ 15,078	$ 19,653
Lathes							
Units	1,359	2,073	3,677	4,986	8,203	12,036	12,134
Value	$ 66,412	$ 88,872	$158,981	$274,918	$448,602	$ 672,891	$ 731,755
Special Machines							
Units	17	22	50	33	62	101	103
Value	$ 3,443	$ 4,910	$ 8,972	$ 8,567	$ 18,123	$ 28,370	$ 53,149
Elec. Discharge Machines							
Units	NA	NA	NA	NA	1,593	2,554	3,020
Value	NA	NA	NA	NA	$ 80,298	$ 143,541	$ 180,846
Machining Centers							
Units	401	520	926	1,371	2,927	5,231	7,393
Value	$ 40,549	$ 44,701	$ 86,175	$149,323	$277,935	$ 491,383	$ 749,644
Other NC Metal Cutting Machines							
Units	6	185	37	97	265	190	224
Value	$ 408	$ 5,857	$ 2,916	$ 5,488	$ 20,692	$ 17,671	$ 27,085

NA - Not Available. Exchange rate: $1 = 220.53 Yen.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE TRADE WITH THE UNITED STATES NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1981

(Values in Thousands of U.S. Dollars)

	Exports to U.S.		Imports from U.S.	
Type of Machine	Units	Value	Units	Value
Boring Machines	10	$ 3,424	1	$ 453
Drilling Machines	49	1,252	NA	NA
Grinding Machines	16	1,723	22	5,555
Lathes	3,878	314,774	6	1,841
Milling	364	26,831	5	154
Machining Centers	2,180	221,530	NA	NA

NA—Not Available. Exchange Rate: $1 = 220.53 Yen.

Source: Japan Tariff Association.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS

Selected Destinations, 1979 to Date

(Values in Thousands of U.S. Dollars)

	1979		1980		1981	
Destination	Units	Value	Units	Value	Units	Value
TOTAL EXPORTS	183,790	$942,843	198,926	$1,188,873	301 567	$1,409,164
North & South America						
Brazil	424	$ 14,765	614	$ 13,398	202	$ 6,312
Canada	8,926	12,009	8,642	27,740	16,187	27,434
Mexico	383	5,712	658	14,060	384	14,492
U.S.A.	72,169	321,426	54,228	471,131	137,009	691,099
Western Europe						
Belgium	1,491	11,160	2,421	34,355	2,032	34,948
France	3,014	9,061	5,651	28,948	3,805	25,697
Netherlands	3,542	8,938	3,202	12,900	670	6,090
Norway	NA	2,117	NA	6,240	634	5,210
Sweden	1,278	10,289	960	24,856	1,066	22,877
United Kingdom	2,507	41,876	5,574	64,366	4,387	50,864
West Germany	5,391	58,772	5,158	99,299	4,395	87,172
Eastern Europe						
Poland	413	29,438	30	3,246	110	10,452
Rumania	73	21,618	12	2,845	21	6,149
U.S.S.R.	370	28,873	519	53,429	486	49,581
Asia						
Burma	468	13,556	429	8,635	78	453
Korean Republic	9,817	134,357	3,885	55,118	1,267	30,821
People's Republic of China	310	19,692	274	8,234	278	15,095
Philippines	NA	3,751	NA	3,114	2,009	3,496
Singapore	4,398	17,667	5,241	22,853	6,681	27,792
Taiwan	6,913	62,764	10,741	50,959	9,316	46,787
Thailand	NA	7,186	NA	7,537	5,156	7,477
All Other Countries						
Australia	8,468	16,854	15,293	28,529	24,152	56,178
South Africa	1,232	16,873	5,385	39,480	4,305	48,488
All Other Countries	52,203(a)	74,089	70,009(a)	107,601	76,937	134,199

Exchange rate: 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen.

(a) Includes the shipments to Norway, Thailand and the Philippines.

Source: Japan, Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS TO THE U.S.

1976-1981

(Values in Thousands of U.S. Dollars, F.O.B. Japan)

	Total	Lathes	Drilling Machines	Boring Machines	Milling Machines	Grinding Machines	Other
1976							
Units	32,337	1,541	11,878	35	5,765	2,103	11,015
Value	$ 57.420	$ 34,038	$ 4,937	$ 2,509	$ 4,876	$ 2,559	$ 8,501
1977							
Units	37,765	2,147	4,935	79	7,479	3,368	19,757
Value	$ 98,947	$ 57,915	$ 4,967	$ 4,952	$ 6,617	$ 3,251	$ 21,245
1978							
Units	58,742	2,891	2,281	161	7,661	1,275	44,473
Value	$193,006	$112,572	$ 5,440	$10,624	$ 9,640	$13,684	$ 41,046
1979							
Units	72,169	3,477	906	191	5,083	1,045	61,467
Value	$321,426	$181,813	$ 6,123	$17,726	$11,731	$16,905	$ 87,129
1980							
Units	54,228	4,109	1,053	210	3,426	1,843	43,587
Value	$471,131	$232,110	$ 8,983	$22,046	$26,430	$29,019	$152,543
1981							
Units	137,009	4,675	1,427	203	859	3,205	126,640
Value	$691,099	$337,151	$ 7,831	$20,528	$38,253	$27,865	$259,470

Exchange rate: 1976 $1 = 296.55 Yen; 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS

From Selected Countries, 1979 to Date

(Values in Thousands of U.S. Dollars)

	1979		1980		1981	
Country of Origin	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	14,917	$119,606	14,599	$168,561	17,244	$175,137
United States	2,227	$ 26,728	2,015	$ 42,423	1,790	$ 35,655
Western Europe						
Austria	NA	219	460	197	784	263
France	710	1,205	621	1,722	671	1,954
Italy	68	351	111	1,985	85	2,118
Sweden	160	1,141	104	866	141	2,467
Switzerland	503	21,527	970	36,468	847	41,155
United Kingdom	532	2,678	519	3,067	427	3,992
West Germany	820	44,833	763	48,650	1,225	53,535
Eastern Europe						
Czechoslovakia	84	2,044	90	2,010	73	11,687
East Germany	25	3,354	39	3,847	46	7,106
Poland	NA	128	2	199	NA	NA
U.S.S.R.	155	2,249	261	4,786	183	2,435
Asia						
Singapore	284	2,637	512	5,065	737	7,214
Taiwan	7,790	3,732	6,764	4,613	8,879	6,294
Other Countries	1,559(a)	6,780	1,368	12,663	1,356	9,332

NA - Not Available. Exchange rate: 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen.

(a) Includes units shipped from Austria and Poland.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine and Selected Countries, 1981
(Values in Thousands of U.S. Dollars)

	Country of Origin					
Type of Machine	West Germany	Switzerland	United States	Eastern Europe (a)	U.S.S.R.	France
GRAND TOTAL						
Units	1,225	847	1,790	142	183	671
Value	$53,535	$41,155	$35,655	$9,133	$2,440	$ 1,954
Boring Machines						
Units	26	20	6	6	5	
Value	$ 3,111	$ 2,938	$ 726	$ 553	$385	—
Drilling Machines						
Units	38	10	225	2	42	—
Value	$ 2,254	$ 181	$ 304	$ 50	$281	—
Gear Cutting and Finishing						
Units	78	102	61	26	9	—
Value	$ 7,940	$ 7,287	$10,153	$3,918	$349	—
Grinding Machines						
Units	452	226	873	17	20	35
Value	$24,092	$ 7,233	$16,896	$2,888	$372	$11,034
Lathes						
Units	57	267	49	28	21	—
Value	$ 1,555	$11,699	$ 3,065	$ 993	$295	—
Milling Machines						
Units	50	16	209	62	33	521
Value	$ 8,022	$ 304	$ 1,492	$ 707	$540	$ 898
Planing Machines						
Units	—	—	—	—	—	—
Value	—	—	—	—	—	—
Other Metal Cutting Machines						
Units	524	206	367	1	53	115
Value	$ 6,561	$11,513	$ 3,020	$ 23	$218	$ 23

(a) Czechoslovakia, East Germany, Bulgaria and Rumania.

Note: Individual items may not add to totals due to rounding.

Exchange rate: $1 = 220.53 Yen.

Source: Japan, Ministry of Finance.

UNITED KINGDOM NET NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS
1961 to Date
(Millions of Dollars)

Year	Net New Orders			Shipments			Unfilled Orders
	Total	Domestic	Foreign	Total	Domestic	Foreign	
1961	$ 356.3	$254.1	$102.2	$324.9	$244.5	$ 96.0	$328.2
1962	276.0	169.4	106.7	356.3	256.9	99.4	247.3
1963	265.4	171.3	94.1	319.2	209.7	109.6	193.0
1964	388.4	282.0	106.5	339.5	234.1	105.4	241.5
1965	442.0	322.0	120.0	395.9	272.9	123.0	292.0
1966	448.3	319.5	128.8	459.2	332.9	126.3	310.0
1967	446.6	276.7	169.9	473.7	342.8	130.9	279.2
1968	441.1	290.6	150.5	404.6	272.4	132.2	278.6
1969	569.3	361.7	207.6	453.8	285.8	168.0	394.1
1970	513.4	313.9	199.4	524.6	329.5	195.1	382.8
1971	380.9	199.8	181.1	513.1	300.6	212.4	261.8
1972	480.4	303.5	176.9	462.1	279.2	182.9	283.5
1973	701.2	429.1	272.1	487.2	286.8	200.4	473.0
1974	813.7	448.8	364.9	595.0	350.6	244.4	731.9
1975	548.4	321.5	226.9	723.0	414.2	308.8	510.6
1976	570.8	346.8	224.0	635.8	377.5	258.3	350.4
1977	839.8	553.5	286.3	707.1	443.5	263.6	471.4
1978	1,046.4	689.3	357.1	960.0	599.0	361.0	604.8
1979(r)	1,260.3	771.6	488.7	1,205.9	793.6	412.3	722.8
1980(p)	1,070.9	580.8	490.1	1,425.4	850.2	575.2	437.8

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
Number of Employees, 1967 to Date

Mid-Year	Employees	Mid-Year	Employees
1967	70,500	1974	53,200
1968	68,400	1975	53,000
1969	68,600	1976	49,000
1970	70,100	1977	50,100
1971	63,500	1978	51,900
1972	54,000	1979	61,150
1973	52,100	1980	58,900E

E - Estimate by NMTBA.

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

Note: The U.K. Department of Trade and Industry recently released a new series on employment in the machine tool industry for 1974 to date. Previous employment data, which included the welding equipment industry, have been adjusted by NMTBA to provide estimated employment in the machine tool industry for years prior to 1974.

UNITED KINGDOM SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, Units and Value, 1978 and 1979

(Values in Thousands of U.S. Dollars)

Type of Machine	1978		1979	
	Units	Value	Units	Value
TOTAL (excluding parts)	969	$102,376	1,058	$139,125
Drilling Machines	39	3,374	95	12,641
Boring Machines	33	5,161		
Milling Machines	27	714		
Machining Centers (automatic tool change)	117(a)	17,714(a)	200	34,913
Machining Centers (manual tool change) and Indexing Turret	325	24,647	359(b)	35,159(b)
Lathes	288	39,191	(c)	(c)
Other Numerically Controlled Machines	140	11,576	404	56,411

NA - Not Available.

(a) "Vertical Machining Centers, ATC" included in "Other Numerically Controlled Machines".
(b) "Indexing Turret" included in "Other Numerically Controlled Machines".
(c) "Lathes" included in "Other Numerically Controlled Machines".

Exchange Rate: 1978: 1 Pound = $1.920; 1979: 1 Pound = $2.122; 1980: 1 Pound = $2.326.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM ORDERS AND SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

1967 to Date

(Values in Thousands of Dollars)

Year	New Orders				Shipments			
	Total		Foreign		Total		Foreign	
	Units	Value	Units	Value	Units	Value	Units	Value
1967	469	$ 18,059	101	$ 6,099	458	$ 25,102	NA	$ 8,877
1968	505	34,157	130	10,904	558	28,500	109	6,113
1969	693	42,245	248	16,596	543	35,105	189	14,738
1970	725	52,561	350	26,978	600	37,773	241	15,848
1971(a)	343	26,320	156	12,842	590	44,591	280	23,023
1972(a)	548	42,199	189	14,551	381	27,173	150	12,735
1973(a)	634	44,562	238	18,884	462	30,379	178	13,255
1974(a)	739	65,520	353	32,362	709	37,452	246	15,171
1975(a)	283	28,833	70	8,610	739	52,719	271	20,898
1976(a)	535	57,429	157	17,820	612	48,635	192	17,598
1977(a)	614	78,484	155	22,406	724	58,307	NA	17,347(b)
1978(a)	681	105,986	209	26,135	969	102,376	245	29,086
1979(a)	1,262	180,516	399	48,063	1,058	139,125	251	36,078
1980(a)	NA	159,766	NA	53,954	NA	201,471	NA	53,745

NA - Not Available.

(a) Excludes parts.
(b) Does not include figures for Drilling, Boring or Milling Machines.

Source: The Machine Tool Trades Association, and United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL CUTTING MACHINE TOOLS (a)
By Type of Machine, Units and Value, 1978 and 1979
(Values in Thousands of U.S. Dollars)

Type of Machine	1978 Units	1978 Value	1979 Units	1979 Value
TOTAL	54,525	$648,115	53,458	$291,364
Boring Machines				
Fine	72	5,418	95	6,945
Horizontal	138	23,532	119	21,400
Jig, Vertical and Other	182	2,131	232	2,321
Drilling Machines				
Vertical	10,840	11,679	10,665	15,213
Radial	743	12,981	620	10,837
Other			97	6,122
Gear Cutting and Finishing Machines	200	13,425	215	16,919
Grinding and Polishing Machines				
Cylindrical—External	1,140	46,904	1,015	57,676
Cylindrical—Internal	73	4,278	50	4,441
Surface	1,505	24,060	1,723	31,079
Other Grinding	7,100	20,275	5,755	24,660
Honing and Lapping	1,058	10,299	1,289	16,687
Lathes				
Automatic Bar	523	14,383	354	12,136
Automatic Chucking	183	10,639	162	11,304
Center Lathes	14,733	78,879	14,527	93,805
Other Lathes	2,688	94,274	2,520	103,660
Milling Machines				
Knee and Column	4,591	44,484	4,333	54,385
Bed Type	213	15,684	193	17,683
Other	1,607	6,088	616	9,027
Other Metal Cutting				
Broaching Machines	83	5,820	83	9,681
Planing, Shaping and Slotting	5,255	14,742		
Sawing and Cut-Off			(b)	(b)
Screwing and Threading	327	12,317	217	13,345
Transfer and Single Station Machines	250	15,016	953	94,618
Machining Centers	198	45,513		
Unit Heads	670	2,851		
Other Metal Cutting, N.E.C.	113	2,897	7,625	22,113
Parts for Metal Cutting Machine Tools	—	109,546	—	135,309

NA - Not Available.

(a) Excludes numerically controlled machines.
(b) Included in "Other Metal Cutting Machine Tools".

Exchange Rate: 1978: 1 Pound = $1.920; 1979: 1 Pound = $2.122.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)

By Type of Machine, Units and Value, 1978 and 1979

(Values in Thousands of U.S. Dollars)

Type of Machine	1978		1979	
	Units	Value	Units	Value
TOTAL	17,679	$216,077	22,750	$250,417
Presses				
Hydraulic-Open Front	760	9,180	705	15,283
Hydraulic Straight, Extrusion & Other	3,629	27,575	2,482	18,839
Mechanical Open Front	980	11,712	937	17,016
Mechanical—Straight Sided	341	14,160	365	14,315
Pneumatic & Other Mechanical	176	13,298	(b)	(b)
Forging Machines	222	12,380	248	11,049
Punching & Shearing Machines	3,659	33,310	2,238	27,440
Plate & Sheet Bending & Forming	2,288	19,071	2,860	32,382
Bar, Tube & Section Drawing & Forming	2,961	11,149	8,696	12,982
Wire & Strip Drawing & Working	1,199	22,861	1,095	30,328
Riveting and Other Metal Forming	1,464	10,481	3,124	24,483
Parts for Metal Forming Machine Tools	—	30,900	—	46,300

Exchange Rate: 1978: 1 Pound = $1.920; 1979: 1 Pound = $2.122.

(a) Excludes numerically controlled machines.
(b) Included in "Riveting and Other Metal Forming".

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM IMPORTS AND EXPORTS OF MACHINE TOOLS

New and Used, for Selected Countries, 1980

(Values in Thousands of U.S. Dollars)

Imports		Exports			
Origin	Value	Destination	Value	Destination	Value
West Germany	$181,661	U.S.A.	$134,797	Netherlands	$10,804
U.S.A.	102,577	West Germany	58,835	China	10,498
Japan	81,177	South Africa	47,843	Spain	10,148
Switzerland	55,126	France	37,993	Belgium	9,516
Italy	51,870	Italy	28,926	Nigeria	7,866
France	20,934	Canada	25,005	Taiwan	7,444
Spain	19,538	Switzerland	24,761	Austria	6,484
Sweden	19,073	Ireland	23,936	Algeria	6,000
Netherlands	11,165	Mexico	20,422	Finland	4,898
Austria	10,700	U.S.S.R.	19,213	Brazil	4,854
Belgium	8,374	India	15,888	Argentina	4,736
East Germany	7,676	Sweden	15,439	Rumania	4,508
Czechoslovakia	7,211	Australia	14,687	Denmark	4,475
Denmark	6,513	Poland	13,747	Japan	4,371
Poland	5,396	Singapore	11,369	Yugoslavia	3,936

Exchange Rate: 1 Pound = $2.326.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1980

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	West Germany	France	Poland	Brazil	U.S.S.R	Rep. of So. Africa
Grand Total (incl. N/C)								
Units	77,755	7,303	17,353	4,353	145	99	142	4,640
Value	$674,197	$134,816	$58,843	$37,999	$13,751	$4,855	$19,215	$47,851
Boring (incl. N/C)								
Units	489	78	21	27	8	2	—	30
Value	$ 41,418	$ 12,303	$ 2,990	$ 1,183	$ 1,294	6	—	$ 2,681
Boring, N/C								
Units	37		3	1	1	—	—	1
Value	$ 11,024	$ 3,236	$ 1,061	$ 101	$ 433	—	—	$ 430
Drilling (incl. N/C)								
Units	2,534	173	135	46	15	5	—	176
Value	$ 19,559	$ 2,712	$ 1,140	$ 365	$ 1,208	$ 143	—	$ 1,414
Drilling, N/C								
Units	77	1	1	—	3	—	—	1
Value	$ 2,213	$ 68	$ 116	—	$ 628	—	—	$ 73
Gear Cutting & Finishing								
Units	154	59	10	6	12	—	13	3
Value	$ 17,618	$ 8,031	$ 1,210	$ 684	$ 1,373	—	$ 2,967	$ 144
Grinding & Polishing								
Units	40,681	1,157	15,180	3,074	43	38	88	486
Value	$106,469	$ 21,421	$10,839	$ 4,311	$ 2,555	$ 1,763	$ 4,293	$ 3,630
Lathes (incl. N/C)								
Units	8,912	1,774	1,086	419	8	15	15	761
Value	$163,290	$ 33,489	$17,977	$15,155	$ 1,802	$ 1,655	$ 2,589	$ 9,716
Lathes, N/C								
Units	178	25	26	26	2	4	—	2
Value	$ 31,957	$ 3,153	$ 6,302	$ 4,754	$ 1,061	$ 1,244	—	$ 341
Milling (incl. N/C)								
Units	3,036	383	156	117	5	3	2	580
Value	$ 68,348	$ 18,497	$ 3,649	$ 4,504	$ 515	$ 392	$ 247	$ 7,012
Milling, N/C								
Units	81	16	8	10	1	1	1	1
Value	$ 15,363	$ 3,700	$ 749	$ 1,770	$ 333	$ 175	$ 231	$ 346
Other Metal Cutting								
Units	12,076	2,916	403	351	20	11	8	1,795
Value	$124,328	$ 26,401	$11,793	$ 5,259	$ 3,072	$ 470	$ 802	$14,272
Total Metal Forming								
Units	9,873	763	362	313	34	25	16	809
Value	$133,160	$ 11,962	$ 9,245	$ 6,538	$ 1,932	$ 426	$ 8,317	$ 8,982

Exchange Rate: 1 Pound = $2.326.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1980

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	West Germany	United States	Switzerland	Italy	France
Grand Total (incl. N/C)						
Units	53,351	7,157	4,685	967	7,531	2,195
Value	$622,161	$181,754	$102,504	$55,052	$51,931	$20,934
Boring (incl. N/C)						
Units	465	114	62	35	82	10
Value	$ 44,085	$ 18,254	$ 3,814	$ 5,576	$ 3,274	$ 901
Boring, N/C						
Units	75	30	5	11	14	1
Value	$ 21,376	$ 10,187	$ 698	$ 3,458	$ 3,835	$ 473
Drilling (incl. N/C)						
Units	7,476	449	271	40	80	131
Value	$ 21,541	$ 4,249	$ 6,966	$ 403	$ 2,363	$ 234
Drilling, N/C						
Units	62	6	34	1	6	—
Value	$ 7,424	$ 1,405	$ 3,908	$ 93	$ 1,050	—
Gear Cutting & Finishing						
Units	92	43	2	7	6	5
Value	$ 10,699	$ 5,904	$ 510	$ 1,360	$ 708	$ 124
Grinding & Polishing						
Units	21,579	2,785	1,435	211	4,916	162
Value	$ 77,202	$ 23,289	$ 10,089	$15,892	$ 7,708	$ 1,099
Lathes (incl. N/C)						
Units	3,574	377	259	146	112	48
Value	$135,555	$ 31,405	$ 11,050	$ 8,911	$ 9,609	$ 3,169
Lathes, N/C						
Units	879	93	68	16	26	12
Value	$ 88,066	$ 19,389	$ 7,219	$ 2,901	$ 5,100	$ 1,806
Milling (incl. N/C)						
Units	2,161	199	77	58	138	118
Value	$ 61,883	$ 13,547	$ 4,385	$ 4,057	$ 7,884	$ 5,462
Milling, N/C						
Unit	146	37	25	11	14	7
Value	$ 23,377	$ 8,247	$ 3,409	$ 2,767	$ 3,203	$ 922
Other Metal Cutting						
Units	10,664	1,694	1,238	139	1,441	1,218
Value	$138,145	$ 42,950	$ 36,734	$ 7,870	$ 8,931	$ 2,411
Total Metal Forming						
Units	7,140	1,496	1,341	331	756	503
Value	$133,052	$ 42,156	$ 28,956	$10,982	$ 7,618	$7,356

Exchange Rate: 1 Pound = $2.326.

Source: The Department of Trade and Industry.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Type of Machine, Units and Value, 1979, 1980 and 1981
(Thousands of U.S. Dollars)

Type of Machine	1979		1980		1981	
	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	8,959	$ 91,322	16,051	$103,196	14,650	$141,863
Metal Cutting Total	7,190	63,415	8,592	67,131	9,742	46,647
Lathes	645	16,823	709	19,932	501	15,962
Boring Machines	81	766	74	867	55	822
Milling Machines	588	3,050	936	3,727	705	1,527
Planing Machines	536	1,426	5	286	23	360
Broaching Machines	(a)	(a)	944	1,416	548	525
Drilling Machines	205	1,127	306	2,332	410	1,097
Grinding & Polishing Machines	3,619	12,484	4,446	15,477	598	6,010
Gear Cutting Machines	89	5,399	26	4,856	36	644
Other Metal Cutting	1,427	22,340	1,152	18,238	6,866	19,701
Metal Forming Total	1,769	27,907	7,459	36,065	4,908	95,216
Presses	234	10,111	901	15,723	418	79,003
Forging & Stamping Machines	17	2,150	13	153	43	979
Bending & Rolling Machines	434	3,362	462	4,158	2,319	7,565
Other Metal Forming	1,084	12,284	6,082	16,031	2,128	7,668
TOTAL EXPORTS	69,095	$210,766	61,438	$228,268	70,895	$206,782
Metal Cutting Total	28,482	157,103	21,485	174,922	23,236	155,313
Lathes	4,939	36,684	3,630	393,164	3,029	36,703
Boring Machines	169	9,391	319	11,289	181	12,878
Milling Machines	6,301	61,910	7,060	74,294	7,673	62,884
Planing Machines	631	2,944	9	109	41	1,021
Broaching Machines	(a)	(a)	916	2,783	581	2,502
Drilling Machines	2,722	12,563	2,280	11,917	1,744	11,097
Grinding & Polishing Machines	7,929	13,827	2,695	14,279	705	9,660
Gear Cutting Machines	29	417	16	192	20	290
Other Metal Cutting	5,762	19,367	4,560	20,743	9,262	18,276
Metal Forming Total	40,613	53,662	39,953	53,346	47,659	51,469
Presses	2,292	22,435	2,275	20,934	1,905	17,159
Forging & Stamping Machines	100	400	177	116	224	2,213
Bending & Rolling Machines	34,104	15,463	35,149	17,842	43,748	19,262
Other Metal Forming	4,117	15,364	2,352	14,454	1,782	12,835

Exchange Rate: 1979 $1 = 67.125 Pesetas; 1980 $1 = 71.702 Pesetas; 1981 $1 = 92.314 Pesestas.

(a) Included with Planing Machines.

Source: Asociación Española de Fabricantes de Máquinas-Herramienta.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS

By Origin and Destination, 1979 to date (a)

(Thousands of U.S. Dollars)

Country	Imports			Exports		
	1979	1980	1981	1979	1980	1981
GRAND TOTAL	$91,322	$103,196	$141,863	$210,766	$228,268	$206,782
Argentina	—	—	—	—	4,706	3,075
Australia	—	—		3,026	4,173	4,858
Austria	834	588	998	—	1,720	1,344
Belgium-Luxemburg	876	1,796	3,525	2,916	2,802	2,409
Canada	—	—	—	5,644	5,279	5,067
Chile	—	—	—	—	2,450	2,381
Cuba	—	—	—	—	1,483	3,462
East Germany	540	1,457	1,514	—	—	—
Ecuador	—	—	—	—	1,744	1,579
Finland	—	—	—	—	2,313	3,077
France	11,906	5,866	4,498	12,204	17,758	12,276
Italy	17,932	16,962	18,655	9,053	13,057	10,981
Japan	1,413	4,082	6,028	—	—	—
Mexico	—	—	—	17,104	25,097	38,342
Morocco	—	—	—	NA	1,379	1,899
Netherlands	805	750	731	3,172	3,912	2,643
Portugal	—	—	—	6,100	6,620	8,517
South Africa	—	—	—	8,156	13,926	15,551
Sweden	689	—	763	1,571	1,554	1,966
Switzerland	4,833	6,121	5,295	2,096	4,309	2,711
United Kingdom	5,464	9,443	5,486	18,279	18,401	7,050
U.S.A.	5,318	9,919	9,535	23,382	26,721	21,501
Venezuela	—	—	—	17,844	7,194	4,885
West Germany	38,506	42,878	82,830	29,045	29,754	22,015
All Other	741	1,101	2,006	46,801	31,916	29,190

Exchange Rate: 1979 $1 = 67.125 Pesetas; 1980 $1 = 71.702 Pesetas; 1981 $1 = 92.314 Pesetas.

(a) Countries without data are included in "All Other".

Source: Asociación Española de Fabricantes de Máquinas Herramienta.

FRENCH PRODUCTION OF METAL CUTTING MACHINE TOOLS
By Type of Machine, Units and Value, 1978, 1979 and 1980
(Values in Thousands of U.S. Dollars)

Type of Machine	1978		1979		1980	
	Units	Value	Units	Value	Units	Value
TOTAL	40,147	$409,656	38,990	$507,284	35,970	$609,003
Boring Machines	65(a)	10,272(a)	41	18,810	40	8,218
Drilling Machines	8,450	17,653	7,943	15,430	7,446	17,477
Grinding, Polishing, Honing & Lapping Machines	19,548	35,560	18,324	51,983	16,697	67,647
Lathes	3,931	115,655	3,733	139,703	3,388	165,371
Milling Machines	2,870	126,578	3,019	139,955	2,741	167,689
Other Metal Cutting, Including Transfers	5,283	103,938	5,930	141,403	5,658	182,601

Exchange Rate: 1978 $1 = 4.513 Francs; 1979 $1 = 4.254 Francs; 1980 $1 = 4.226 Francs.

(a) Does not include machines under 5 metric tons.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH PRODUCTION OF METAL FORMING MACHINE TOOLS
By Type of Machine, Units and Value, 1978, 1979 and 1980
(Values in Thousands of U.S. Dollars)

Type of Machine	1978		1979		1980	
	Units	Value	Units	Value	Units	Value
TOTAL	14,390	$161,846	13,304	$215,388	12,773	$197,052
Presses:						
Hydraulic	1,682	51,141	1,713	74,255	1,649	66,224
Mechanical	404	20,640	383	21,353	334	19,659
Punching and Shearing Machines	4,827	38,980	3,897	44,124	3,446	49,941
Bending and Forming Machines	6,356	20,621	5,759	20,122	6,035	21,015
Other Metal Forming	1,121	30,464	1,552	55,534	1,309	40,212

Exchange Rate: 1978 $1 = 4.513 Francs; 1979 $1 = 4.254 Francs; 1980 $1 = 4.226 Francs.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH PRODUCTION AND EXPORTS OF N/C MACHINES (a)

Units and Value, 1968 to Date

(Values in Millions of U.S. Dollars)

Year	Production		Exports	
	Units	Value	Units	Value
1968	154	$ 12.2	46	NA
1969	154	12.7	64	NA
1970	147	11.0	46	$ 3.9
1971	247	25.0	83	10.5
1972	230	27.8	61	5.6
1973	389	42.7	141	12.6
1974	535	51.0	261	22.3
1975	612	75.5	217	23.7
1976	576	80.4	165	26.6
1977	579	97.6	223	52.7
1978	867	163.3	391	104.0
1979	1,068	196.1	417	94.5
1980	1,238	189.2	370	85.2

NA - Not Available.

(a) The survey covered metalworking and woodworking manufacturers.

Source: Syndicat des Constructeurs Français de Machines-Outils; Survey of 300 enterprises.

FRENCH MACHINE TOOL INDUSTRY

Selected Data, 1977 to Date

(Values in Millions of U.S. Dollars)

	1977	1978	1979	1980	1981
Employment	21,447	20,745	20,158	19,650	18,984
Production Workers	13,082	12,497	12,033	11,597	11,156
Others	8,365	8,248	8,125	8,053	7,818
Average Weekly Hours	39.5	40.4	40.5	40.7	40.2
Compensation	$206.3	$245.3	$282.1	$ 314.9	$271.3
Wages	100.5	118.1	135.2	150.5	131.3
Salaries	105.8	127.2	146.9	164.4	140.0
Orders (a)	$641.5	$783.3	$921.9	$1,015.4	$722.4
Domestic	352.0	412.8	585.6	680.3	438.2
Foreign	289.5	370.4	336.3	335.1	284.2
Shipments (a)	$590.6	$723.2	$877.1	$ 954.0	$809.5

Exchange Rates: 1977 $1 = 4.913 Francs; 1978 $1 = 4.513 Francs; 1979 $1 = 4.254 Francs; 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs.

(a) Excluding Tax.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH EXPORTS OF MACHINE TOOLS
By Destination, Units and Value, 1979 to Date
(Values in Thousands of U.S. Dollars)

Destination	1979		1980 (r)		1981	
	Units	Value	Units	Value	Units	Value
TOTAL	NA	$458,442	164,474	$515,859	NA	$390,482
WESTERN EUROPE						
Austria	14,142	3,623	22,632	3,022	10,078	2,195
Belgium-Luxembourg	121,909	17,537	28,656	15,747	3,851	12,628
Denmark	1,061	2,513	1,730	1,906	NA	NA
Finland	566	1,671	1,130	1,572	756	2,098
Greece	7,156	2,247	3,191	4,006	NA	NA
Italy	26,026	18,904	31,176	26,400	9,148	16,939
Netherlands	19,357	4,916	6,689	5,956	1,529	3,542
Portugal	514	1,009	2,165	3,848	657	12,989
Spain	1,869	11,448	1,274	16,261	1,708	9,670
Sweden	10,349	3,629	3,479	5,097	1,116	5,697
Switzerland	2,826	12,382	8,013	16,696	3,450	16,867
Turkey	204	7,806	182	14,617	87	7,329
United Kingdom	5,113	33,044	4,213	22,183	8,592	19,803
West Germany	64,716	48,356	14,601	54,560	14,808	39,696
EASTERN EUROPE						
Bulgaria	NA	NA	NA	NA	NA	NA
Czechoslovakia	28	1,370	122	4,368	11	992
East Germany	NA	NA	138	28,566	708	34,220
Hungary	120	1,923	28	1,842	NA	NA
Poland	501	8,252	356	16,333	139	4,580
Rumania	2,032	72,968	245	34,485	62	2,715
U.S.S.R.	254	57,767	6,748	67,210	353	30,454
Yugoslavia	811	13,964	275	14,017	187	3,845
NORTH AND CENTRAL AMERICA						
Canada	729	3,823	498	4,254	874	7,424
Mexico	84	1,506	96	5,157	1,440	17,681
United States	3,675	25,653	4,871	30,574	4,707	31,104
SOUTH AMERICA						
Argentina	250	6,640	465	10,171	209	4,762
Brazil	133	2,318	145	3,133	1,275	5,322
Venezuela	NA	NA	NA	NA	NA	NA
ASIA						
India	60	5,807	30	2,098	53	3,262
Iran	47	1,479	NA	NA	NA	NA
Israel	237	5,188	125	1,521	220	2,734
Japan	3,152	2,034	1,570	2,569	710	1,316
Lebanon	NA	NA	137	2,126	NA	NA
People's Rep. of China	10	1,256	16	1,716	14	1,888
OCEANIA						
Australia	689	1,883	744	3,541	1,028	2,863
AFRICA						
Rep. of S. Africa	1,319	1,832	911	11,266	3,331	5,169
Franc Area	4,393	5,411	3,198	8,828	2,125	5,406
OTHER	NA	69,183	NA	70,210	NA	75,292

NA - Not available; Exports, if any, are included in "Other". r - Revised.

Exchange Rate: 1979, $1 = 4.2545 Francs; 1980, $1 = 4.226 Francs; 1981, $1 = 5.4346.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH IMPORTS OF MACHINE TOOLS

By Origin, Units and Value, 1979 to Date

(Values in Thousands of U.S. Dollars)

Destination	1979		1980		1981	
	Units	Value	Units	Value	Units	Value
TOTAL	176,756	$371,458	187,403	$554,058	271,801	$566,550
WESTERN EUROPE						
Austria	869	1,536	1,353	5,232	1,598	4,427
Belgium-Luxembourg	1,488	12,120	2,043	11,457	1,047	13,670
Denmark	4,719	562	3,935	1,179	2,866	770
Finland	12	327	100	494	18	210
Italy	19,347	56,592	17,517	91,394	19,175	124,486
Netherlands	18,715	6,410	10,719	11,292	17,009	4,853
Norway	11	283	12	64	24	338
Portugal	16	49	28	194	13	25
Spain	7,616	13,136	1,417	18,656	925	12,254
Sweden	603	5,282	1,011	8,878	655	8,851
Switzerland	2,636	58,534	2,948	65,120	4,430	57,486
United Kingdom	15,425	18,558	2,443	35,783	3,685	24,663
West Germany	46,639	139,002	37,871	190,255	36,970	194,311
EASTERN EUROPE						
Bulgaria	283	958	324	1,255	387	1,394
Czechoslovakia	114	2,336	121	3,888	147	2,663
East Germany	153	4,930	575	4,386	333	3,981
Hungary	76	875	20	715	17	551
Poland	2,627	3,901	6,038	3,110	1,208	1,639
Rumania	52	1,334	84	1,922	58	669
U.S.S.R.	919	3,355	2,481	4,100	774	1,758
Yugoslavia	72	368	62	521	22	149
NORTH AND CENTRAL AMERICA						
Canada	195	1,124	39	541	35	935
United States	3,986	20,998	3,533	39,909	1,822	41,579
ASIA						
India	21	145	32	425	7	151
Japan	3,048	12,458	4,010	40,598	4,734	48,179
Taiwan	46,369	3,484	87,766	6,726	172,095	9,680
OCEANIA						
Australia	3	50	2	9	NA	NA
OTHER	742	2,751	919	5,955	1,747	6,938

NA - Not available; imports, if any, are included in "Other".

Exchange Rate: 1979 $1 = 4.2545 Francs; 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH FOREIGN TRADE IN MACHINE TOOLS
By Type of Machine, Units and Value (a), 1977-1980
(Values in Thousands of U.S. Dollars)

	1977		1978	1979	1980	
Type of Machine	Units	Value	Value	Value	Units	Value
TOTAL IMPORTS	41,015	$286,251	$289,616	$371,458	187,220	$554,058
Metal Cutting Total (including N/C)	32,779	192,156	201,947	269,919	174,435	401,871
Boring Machines (including N/C)	228	18,722	11,528	11,736	493	24,349
Boring Machines, N/C	21	1,373	2,562	4,972	98	16,951
Drilling Machines (including N/C)	5,125	20,967	19,062	22,716	34,950	33,212
Drilling Machines, N/C	60	8,501	5,288	10,977	432	16,779
Gear Cutting	127	6,815	8,845	10,413	164	11,690
Grinding & Polishing	16,426	38,741	44,139	57,291	119,583	73,515
Lathes (including N/C)	2,848	53,219	52,925	68,646	6,093	126,336
Lathes, N/C	129	12,143	11,345	22,801	642	54,901
Milling Machines (including N/C)	1,578	22,702	29,179	47,164	1,944	61,991
Milling Machines, N/C	43	5,768	6,377	17,961	270	30,326
Other Metal Cutting	6,447	30,990	36,269	51,953	11,208	70,778
Metal Forming Total	8,236	94,095	87,669	101,539	12,785	152,187
Hydraulic Presses	429	8,083	3,519	4,994	334	8,948
Mechanical Presses	1,348	33,222	22,539	30,379	1,271	30,782
Presses, N/C	7	96	337	925	16	828
Forging Machines	125	4,699	3,420	4,701	118	12,344
Punching, Shearing, Bending and Forming Machines	3,881	25,502	28,263	33,555	6,505	56,743
Wire Drawing Machines	246	5,103	7,082	5,807	387	11,402
Other Metal Forming	2,200	17,390	22,509	21,178	1,154	31,140
TOTAL EXPORTS	59,203	$269,290	$382,683	$458,442	164,474	$515,859
Metal Cutting Total (including N/C)	42,978	177,090	270,505	290,246	136,443	343,285
Boring Machines (including N/C)	253	6,383	14,311	22,762	19,433	21,045
Boring Machines, N/C	22	1,187	4,673	5,786	69	11,814
Drilling Machines (including N/C)	8,574	9,587	14,081	15,655	62,465	14,049
Drilling Machines, N/C	94	991	1,983	835	120	1,168
Gear Cutting	76	1,729	1,211	1,414	112	2,262
Grinding & Polishing	9,882	21,589	29,809	49,070	38,363	63,409
Lathes (including N/C)	2,646	58,481	91,472	97,716	3,337	106,985
Lathes, N/C	230	15,956	35,840	32,772	438	46,558
Milling Machines(including N/C)	3,516	43,643	73,019	63,772	3,618	84,361
Milling Machines, N/C	109	10,943	11,123	11,399	505	20,347
Other Metal Cutting	18,031	35,678	46,602	39,857	7,822	51,174
Metal Forming Total	16,225	92,200	112,178	168,196	28,031	172,574
Hydraulic Presses	331	5,657	2,977	5,615	450	13,454
Mechanical Presses	1,297	24,377	19,827	41,114	1,494	26,229
Presses, N/C	16	53	1,331	6,168	19	2,452
Forging Machines	188	1,609	2,910	1,561	309	1,815
Punching, Shearing, Bending and Forming Machines	10,424	36,629	53,882	53,866	11,214	59,160
Wire Drawing Machines	111	4,274	5,945	5,955	675	12,596
Other Metal Forming	3,864	19,601	25,306	53,917	14,161	56,868

Exchange Rate: 1977 $1 = 4.913 Francs; 1978 $1 = 4.5128 Francs; 1979 $1 = 4.2545 Francs; 1980 $1 = 4.2260 Francs.

(a) Unit data not available for 1978 or 1979.

Source: Syndicat des Constructeurs Français de Machine-Outils.

ITALIAN IMPORTS AND EXPORTS OF MACHINE TOOLS
By Origin and Destination 1979 to Date
(Thousands of U.S. Dollars)

	Imports			Exports		
	1979	1980	1981	1979	1980	1981
TOTAL	$255,919	$356,366	$300,342	$689,039	$847,629	$795,222
Austria	6,088	2,130	2,563	8,089	14,301	8,653
Belgium-Luxemborg	2,837	4,586	3,111	11,016	14,489	9,289
Brazil	(a)	(a)	(a)	14,645	15,808	12,810
Canada	(a)	(a)	(a)	12,764	13,520	16,784
Czechoslovakia	5,737	10,842	7,516	(a)	(a)	(a)
East Germany	6,138	13,998	12,615	(a)	(a)	15,204
France	15,896	24,811	16,674	54,666	94,877	116,632
Japan	2,134	6,098	11,807	(a)	(a)	(a)
Mexico	(a)	(a)	(a)	8,194	15,039	33,775
Netherlands	1,579	1,951	5,132	9,515	13,132	9,146
Poland	3,334	5,756	4,368	15,782	14,936	21,763
Rumania	(a)	1,294	2,784	52,182	36,482	12,776
Saudi Arabia	(a)	(a)	(a)	7,484	(a)	12,474
South Africa	(a)	(a)	(a)	18,217	24,389	39,074
Spain	8,605	10,842	11,760	21,499	16,984	19,861
Sweden	3,739	8,439	4,285	8,927	11,412	13,493
Switzerland	37,766	55,033	47,878	18,897	27,749	28,179
Turkey	(a)	(a)	(a)	(a)	(a)	17,383
United Kingdom	20,279	31,620	15,526	44,341	50,610	31,094
United States	15,591	16,863	19,190	41,103	58,005	46,205
U.S.S.R.	7,131	9,710	8,828	78,135	69,696	43,586
Venezuela	(a)	(a)	(a)	20,574	18,009	12,803
West Germany	109,097	135,787	112,866	70,993	102,619	96,445
Yugoslavia	(a)	1,775	2,205	23,895	31,123	13,777
All Other	9,968	16,606	11,234	155,861	212,986	164,017

(a) Imports and exports, if any, are included in "All Other".

Note: Individual items may not add to totals due to rounding.

Exchange Rate: 1979 $1 = 830.86 Lire; 1980 $1 = 855.45 Lire; 1981 $1 = 1,136.77 Lire.

Source: Unione Construttori Italiana Macchine Utensili.

ITALIAN EXPORTS OF MACHINE TOOLS
1979 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1979	1980	1981
TOTAL	$689,039	$847,629	$795,222
Lathes	90,843	129,851	102,730
Boring Machines	44,854	75,514	73,498
Milling Machines	64,533	83,238	78,543
Drilling Machines	46,808	56,613	52,852
Broaching Machines	3,677	6,366	6,725
Grinding Machines	63,752	77,236	67,698
Other Abrasive Machines	41,083	34,783	43,474
Gear Cutting Machines	1,774	3,290	2,790
Shaping-Sawing-Cutting off-Slotting Machines	27,677	32,283	33,762
Presses	68,901	66,168	67,108
Shears and Punching Machines	22,664	25,260	20,954
Bending Machines	41,248	45,027	36,731
Forging Machines	3,301	3,472	2,870
All Others	167,924	208,528	205,487

Exchange rates: 1979 $1 = 830.85 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Construttori Italiana Macchine Utensili.

ITALIAN IMPORTS OF MACHINE TOOLS
1979 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1979	1980	1981
TOTAL	$255,919	$356,366	$300,342
Lathes	40,895	80,891	61,736
Boring Machines	11,960	17,711	14,780
Milling Machines	30,919	40,820	36,650
Drilling Machines	8,152	11,146	12,738
Grinding Machines	26,315	31,793	26,538
Other Abrasive Machines	16,523	21,013	17,435
Gear Cutting Machines	7,395	9,476	9,222
Shaping-Sawing-Cutting off-Slotting Machines	8,513	12,395	11,161
Presses	25,458	32,044	23,638
Shears and Punching Machines	6,576	9,031	10,335
Bending Machines	8,900	10,579	11,696
Forging Machines	6,704	5,782	5,315
All Others	57,609	73,685	59,096

Exchange rates: 1979 $1 = 830.86 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Construttori Italiana Macchine Utensili.

ITALIAN PRODUCTION, IMPORTS AND EXPORTS OF MACHINE TOOLS

By Weight and Value, 1969 to Date

(Weights in Thousands of Metric Tonnes and Values in Millions of U.S. Dollars)

	Shipments		Imports		Exports	
Year	Weight	Value	Weight	Value	Weight	Value
1969	148.0	$ 332.8	42.2	$103.9	71.4	$171.7
1970	188.0	480.0	45.3	123.8	58.9	190.8
1971	186.0	516.2	45.9	159.9	61.8	186.0
1972	170.0	523.0	47.8	134.8	62.5	206.6
1973	162.0	620.9	55.6	187.0	57.2	236.4
1974	205.0	891.8	66.6	261.5	76.1	322.5
1975	160.0	842.5	45.0	212.9	75.7	432.1
1976	140.0	750.9	38.3	160.5	67.0	369.6
1977	146.5	878.3	39.6	192.9	76.5	442.4
1978	150.0	1,060.5	33.8	195.0	89.0	596.3
1979	160.0	1,354.0	36.7	255.9	91.4	689.0
1980	222.7	1,728.1	48.8	356.4	95.0	847.6
1981	NA	1,513.1	44.0	300.3	86.3	795.2

NA - not available.

Exchange Rate: 1975 $1 = 552.85 Lire; 1976 $1 = 832.29 Lire; 1977 $1 = 882.39 Lire; 1978 $1 = 848.66 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire.

Source: Unione Construttori Italiani Macchine Utensili.

SWEDISH PRODUCTION, IMPORTS, AND EXPORTS OF MACHINE TOOLS

Cutting & Forming, By Type of Machine, 1980 and 1981

(Thousands of U.S. Dollars)

	Production		Imports		Exports	
Machine Classification	1980 (r)	1981 (E)	1980	1981	1980	1981
GRAND TOTAL	$306,417	$285,974	$242,835	$234,417	$240,613	$215,340
Total Metal Cutting	151,515	139,432	131,300	134,846	112,309	100,915
Drilling Machines	14,386	13,825	7,319	6,721	13,334	11,212
Gear Cutting Machines	—	—	2,760	2,959	287	274
Grinding and Polishing	49,319	46,412	21,500	22,730	41,201	42,728
Lathes	53,304	49,374	42,025	35,821	39,551	28,668
Milling Machines	28,588	25,674	25,937	25,557	14,867	12,819
Broaching Machines	—	—	1,923	1,236	385	351
Planers and Shapers	2,176	395	51	128	85	184
Other Metal Cutting Machines	3,742	4,147	29,794	39,694	2,599	4,678
Total Metal Forming	81,386	77,418	53,688	56,708	68,571	63,406
Hammers	1,240	1,382	2,962	1,129	807	1,238
Presses incl. Forging Presses	19,605	18,762	8,743	22,816	26,496	19,401
Punching and Shearing Machines	14,505	12,837	20,299	13,450	14,505	11,049
Other Metal Forming Machines	46,036	44,437	21,684	19,312	26,763	31,718
Parts and Accessories	73,517	69,124	57,847	42,863	59,733	51,019

E - Estimate. r - Revised.

Exchange Rate: 1980 $1 = 4.2295 Kronor; 1981 $1 = 5.0634 Kronor.

Source: The Swedish Machine Tool Manufacturers' Association.

SWEDISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Country, 1979 to Date
(Thousands of U.S. Dollars)

Country	Imports 1979	Imports 1980	Imports 1981	Exports 1979	Exports 1980	Exports 1981
TOTAL	$126,833	$184,988	$191,554	$138,380	$180,880	$164,321
Europe						
Austria	718	1,359	1,249	1,544	1,782	2,082
Belgium	1,344	4,718	2,239	736	3,898	1,448
Denmark	5,415	6,764	5,101	8,405	8,633	7,854
Finland	1,391	1,950	2,845	9,469	13,207	11,721
France	3,138	5,615	6,032	5,573	7,460	9,101
Italy	10,256	16,206	13,981	4,191	10,259	5,046
Netherlands	1,592	2,660	2,165	2,115	2,715	2,163
Norway	515	896	427	7,183	9,635	9,486
Portugal	—	9	35	471	255	655
Spain	1,751	1,972	2,251	585	1,196	869
Switzerland	16,863	13,763	14,921	2,945	3,300	1,936
United Kingdom	8,560	14,270	10,615	19,882	19,255	10,248
West Germany	49,853	59,560	74,659	17,575	25,345	16,743
East European Bloc	6,513	10,554	8,271	22,356	13,320	10,359
All Other Europe	—	669	171	1,472	1,145	1,824
United States	5,188	13,748	13,920	31,771	30,704	29,400
Canada	48	76	95	5,159	4,055	4,287
South & Central America	—	—	31	12,424	8,564	14,887
Japan	10,446	27,321	29,746	2,755	2,141	3,804
All Other Asia	3,242	2,878	2,800	11,515	8,087	12,452
Africa	—	—	—	6,222	4,389	6,838
Australia, New Zealand, West Samoa	—	—	—	954	1,535	1,118

Exchange Rate: 1979 $1 = 4.2871 Kronor; 1980 $1 = 4.2296 Kronor; 1981 $1 = 5.0634 Kronor.

Note: Individual items may not add to totals due to rounding.

Source: The Swedish Machine Tool Manufacturers' Association.

SWISS EXPORTS AND IMPORTS OF MACHINE TOOLS
1979 to Date
(Thousands of U.S. Dollars)

	Exports			Imports		
	1979	1980	1981	1979	1980	1981
GRAND TOTAL	$790,853	$870,205	$740,324	$154,173	$225,160	$188,809
Argentina	8,689	6,774	4,264	—	—	—
Australia	3,452	3,598	3,110	—	16	—
Austria	20,849	19,475	17,466	3,162	2,816	3,037
Belgium-Luxembourg	8,641	10,567	7,294	1,267	955	481
Brazil	8,205	9,448	7,578	—	5	—
Canada	2,306	4,437	5,456	1	85	11
People's Rep. of China	23,651	14,074	19,658	—	—	—
Czechoslovakia	16,857	10,677	6,113	2,551	2,727	1,428
Denmark	5,532	7,057	3,504	1,523	1,643	1,870
East Germany	11,513	13,013	9,460	929	1,672	705
France	58,137	63,302	54,708	10,989	14,702	15,002
Hungary	5,643	6,577	6,836	505	411	157
India	15,418	13,988	20,471	428	340	87
Israel	5,037	4,152	3,147	67	51	—
Italy	40,373	56,548	48,750	18,552	26,324	24,653
Japan	19,717	35,673	43,965	7,151	14,972	19,984
Mexico	3,468	8,707	8,506	—	—	—
Netherlands	12,812	12,833	10,600	1,395	2,401	2,802
Pakistan	1,262	1,127	723	—	—	—
Poland	17,121	17,345	14,769	1,793	2,479	995
South Africa	13,514	12,852	13,934	22	0	—
Spain	4,819	5,850	6,037	2,155	4,771	3,082
Sweden	17,289	13,266	14,234	3,161	3,294	2,094
United Kingdom	50,660	47,286	39,292	9,550	15,241	10,746
United States	71,081	94,586	79,666	6,346	10,413	7,931
U.S.S.R.	72,966	81,580	50,855	748	1,062	462
West Germany	174,265	205,725	155,513	79,722	116,322	90,817
Yugoslavia	22,181	16,750	13,844	420	122	103
All Other	75,395	72,928	70,572	1,735	2,336	2,362

Exchange Rate: 1979 $1 = 1.6627 Swiss Francs; 1980 $1 = 1.6749 Swiss Francs; 1981 $1 = 1.9642 Swiss Francs.

Note: Individual items may not add to totals due to rounding.

Source: Verein Schweizerischer Maschinen-Industrieller.

NETHERLANDS IMPORTS AND EXPORTS OF MACHINE TOOLS
By Selected Major Countries, 1976 to 1978

(Thousands of U.S. Dollars)

	Imports			Exports		
Country	1976(a)	1977	1978	1976(a)	1977	1978
GRAND TOTAL	$73,285	$98,667	$173,600	$54,496	$63,951	$85,080
Austria	819	884	1,496	1,290	1,022	1,380
Belgium-Luxembourg	—	2,025	3,709	—	3,135	6,431
Denmark	678	1,034	1,634	1,505	1,472	1,693
France	3,884	3,585	7,059	5,809	4,042	5,459
Italy	5,798	8,361	13,270	1,147	2,939	4,779
Spain	1,883	2,315	3,952	3,516	2,420	918
Sweden	2,351	2,721	3,440	2,832	1,939	1,002
Switzerland	5,311	6,627	13,225	532	987	1,836
United Kingdom	5,696	5,728	7,875	7,035	7,840	12,008
West Germany	35,681	51,050	89,739	11,480	10,355	19,018
Rest of Europe	281	481(r)	224	4,580	2,741	2,844
Eastern Bloc Countries	3,168	3,724(r)	5,339	6,246	16,596	14,628
U.S.A.	3,712	5,103	6,033	1,560	2,678	3,714
All Other Countries	3,023	5,030	16,605	6,964	5,786	9,370

r - Revised.

(a) Excludes trade with Belgium and Luxembourg.

Exchange Rate: 1976 $1 = 2.500 Swiss Francs; 1977 $1 = 2.404 Swiss Francs; 1978 $1 = 1.788 Swiss Francs.

Source: Vereniging Van Metaal-Industrieen.

NETHERLANDS IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS
By Type of Machine, 1978-1980

(Values in Thousands of U.S. Dollars)

	Imports			Exports		
Type of Machine	1978	1979	1980	1978	1979	1980
TOTAL	$153,555	$178,814	$213,520	$83,203	$95,763	$126,955
Lathes	26,347	29,910	32,745	7,765	6,481	8,651
Milling Machines	15,161	21,735	27,715	6,194	11,216	13,279
Grinding, Honing and Polishing Machines	12,157	15,354	18,007	11,371	12,164	14,587
Hydraulic Presses	10,215	5,633	5,784	1,988	2,144	3,622
Other Presses	3,328	3,539	6,539	601	1,346	2,766
Bending, Forming, Straightening, Cutting and Edging Machines	23,665	21,137	27,061	22,696	24,427	35,411
Other Metalworking Machine Tools	25,887	34,247	39,435	10,724	12,911	10,965
Parts and Accessories	36,794	47,258	56,235	21,864	25,075	37,674

Exchange Rates: 1978 $1 = 2.1634 Guilders; 1979 $1 = 2.0060 Guilders; 1980 $1 = 1.9881 Guilders.

Source: Vereniging Van Metaal-Industrieen.

CANADIAN IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS

By Types of Machine, 1979 to Date

(Values in Thousands of U.S. Dollars)

	1979		1980		1981	
Machine Classifications	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	NA	$344,584	NA	$528,881	NA	$674,543
Boring Machinery & Parts	249	17,902	347	34,881	346	54,131
Drilling Machinery & Parts	16,109	14,030	12,262	14,875	27,529	14,900
Grinding Machinery & Parts	57,578	26,177	59,529	52,324	125	14,591
Automatic Lathes	1,898	33,012	668	47,247	67,612	64,446
Turret Lathes, N.E.C.	2,620	5,124	629	5,638	866	51,425
Lathes & Parts, N.E.C.	2,206	25,004	2,235	33,182	859	5,686
Milling Machines & Parts	2,278	25,182	2,686	36,079	2,058	28,538
Shapers, Gear Makers & Parts	333	6,881	643	27,653	3,932	35,836
Transfer Machines & Parts	270	26,397	72	73,774	1,230	50,423
Sawing Machines & Parts	NA	11,667	NA	13,285	NA	20,455
Metalworking Presses & Parts	1,350	38,365	1,050	39,723	NA	16,439
Rolls, Bending Machines & Parts	NA	12,914	NA	17,010	NA	15,662
Shearing Machines & Parts	550	9,910	500	11,334	1,866	63,396
Metal Forging Stamping Machines & Parts	147	10,658	114	9,398	475	7,455
Can Making Machinery & Parts	NA	10,563	NA	16,522	202	107,214
Machine Tools & Parts, N.E.C.	NA	70,798	NA	95,925	NA	123,946
TOTAL EXPORTS(a)	NA	$ 75,963	NA	$ 85,161	NA	$ 99,772
Boring, Drilling Machinery & Parts	510	5,070	163	4,835	156	3,740
Grinding Machinery & Parts	133	5,614	127	6,496	128	5,773
Lathes & Parts	206	5,168	294	6,958	268	6,930
Metalworking Presses & Parts	298	7,588	298	10,455	329	10,018
Machine Tools & Parts, N.E.C.	NA	52,523	NA	56,417	NA	73,311

NA - Not Available. N.E.C. - Not Elsewhere Classfied.

(a) Domestic exports; does not include re-exports by Canada.

Exchange rate: 1979 $1 = 1.1714 Canadian dollars; 1980 $ 1 = 1.1693 Canadian dollars; 1981 $1 = 1.1989 Canadian dollars.

Source: Statistics Canada.

ARGENTINE INDUSTRIAL PRODUCTION

For Selected Products and Industries, 1978 and 1979

Selected Product or Industry	Units of Measure	1978	1979
Machine Tools	Mill. U.S. $	60.0	62.0
Metal Cutting Tools	Mill. U.S. $	24.0	24.5
Metal Forming Tools	Mill. U.S. $	36.0	37.5
Petroleum	Thou. cu. Meters	26,251.0	27,435.0
Refrigerators	Thou. Units	128.0	209.0
Automobiles	Units	179,160	252,882
Tractors	Units	5,939	10,610
Televisions	Thou. Units	350.0	390.0
Electric Power	Kw. hrs.	435.8	718.2
Cement	Thou. tons	6,123.2	6,998.4
Pig Iron	Thou. tons	1,819.2	1,942.2
Raw Steel	Thou. tons	2,787.7	3,192.9
Rolled Steel	Thou. tons	2,552.5	2,955.6

Source: La Camara Argentina De La Máquina Herramienta and "American Machinist".

CZECHOSLOVAK PRODUCTION OF MACHINE TOOLS
By Type of Machine, in Units, 1970 to 1975

Type of Machine	1970	1971	1972	1973	1974	1975
GRAND TOTAL	44,342	47,230	44,454	38,852	38,788	38,572
Metal Cutting Total	35,186	39,568	36,910	31,653	30,188	29,660
Boring Machines	582	580	594	572	558	558
Drilling Machines	6,167	5,853	5,024	NA	NA	NA
Grinding Machines	13,581	17,460	15,685	12,333	11,923	11,917
Lathes						
Center Type	5,833	6,141	6,372	6,327	5,941	5,808
Automatic & Semi-Automatic	1,431	1,447	1,530	1,290	1,254	1,226
Milling Machines	2,894	3,149	3,185	2,847	2,627	2,440
Other Metal Cutting	4,698	4,938	4,520	NA	NA	NA
Metal Forming Total	9,156	7,662	7,544	7,199	8,600	8,912
Power Presses	1,356	1,253	1,532	1,763	1,692	1,919
Other Metal Forming	7,800	6,409	6,012	5,436	6,908	6,993

NA - Not Available.

Sources: Czechoslovakia Statistical Abstract - 1971 and Statistical Survey of Czechoslovakia 1977.

CZECHOSLOVAK IMPORTS AND EXPORTS OF MACHINE TOOLS
In Units, for Selected Years, 1965 to 1977

	Imports			Exports
Year	Total	Metal Cutting	Metal Forming	Total Machine Tools
1965	4,603	3,915	688	13,572
1967	4,184	3,582	602	15,114
1968	5,770	4,972	798	12,749
1969	6,310	5,607	703	17,411
1970	8,020	6,670	1,350	10,953(a)
1971	9,426	8,350	1,076	13,191
1972	9,589	8,422	1,167	12,108
1973	6,969	6,017	952	10,139(a)
1974	10,624	7,806	2,818	9,689(a)
1975	9,753	7,850	1,903	11,320(a)
1976	8,229	6,789	1,440	11,640(a)
1977	13,445	12,236	1,209	9,535(a)

(a) Metal Cutting Machines only.

Sources: Facts On Czechoslovak Foreign Trade - 1978 and Czechoslovakia Statistical Abstract - 1971.

CZECHOSLOVAK IMPORTS AND EXPORTS OF METALWORKING MACHINERY
By Selected Origin and Destination, 1976 and 1977
(Thousands of U.S. Dollars)

	Imports		Exports	
	1976	1977	1976	1977
TOTAL	$207,316	$250,618	$364,918	$389,646
WESTERN EUROPE				
Austria	9,337	11,711	1,810	2,991
Belgium	592	1,028	1,085	1,436
Denmark	195	232	2,028	2,154
France	9,623	3,209	3,711	2,318
Italy	2,805	4,270	4,578	5,816
Netherlands	962	1,797	1,436	2,069
Norway	—	—	1,549	1,927
Spain	50	430	2,505	1,962
Sweden	872	805	3,689	2,204
Switzerland	11,447	10,481	1,169	2,469
United Kingdom	4,933	1,753	3,700	3,527
West Germany	30,298	31,314	6,508	16,900
EASTERN EUROPE				
Bulgaria	8,275	8,778	11,866	12,796
East Germany	56,178	65,067	68,378	63,434
Hungary	11,968	15,699	18,831	15,487
Poland	14,169	22,129	37,228	35,343
Rumania	6,866	12,200	29,778	34,618
U.S.S.R.	30,690	45,088	102,808	117,184
Yugoslavia	4,674	8,345	7,362	11,238
NORTH AND CENTRAL AMERICA				
Canada	—	—	2,353	1,119
Cuba	—	—	216	513
Mexico	—	—	4,142	2,590
USA	260	580	5,365	3,721
SOUTH AMERICA				
Argentina	—	—	1,725	6,646
Brazil	—	—	4,395	2,618
Peru	—	—	527	97
Venezuela	—	—	3,752	2,062
ASIA				
Egypt	—	—	1,734	2,332
India	—	—	2,442	1,604
Iran	—	—	5,531	5,326
Japan	1,485	2,143	984	542
People's Rep. of China	—	—	8,660	7,177
Turkey	—	—	3,835	2,540
ALL OTHER COUNTRIES	1,637	3,559	9,238	13,886

Exchange Rate: 1976 $1 = 5.8 Czechoslovak Crowns; 1977 $1 = 5.67 Czechoslovak Crowns.

Source: Facts on Czechoslovak Foreign Trade - 1978.

U.S.S.R. INDUSTRIAL PRODUCTION
For Selected Products and Industries, 1978 to 1980

	Unit of Measure	1978	1979	1980
MACHINE TOOL INDUSTRY				
Metal Cutting Machines	Thousands	236	231	216
Metal Cutting Machines	Mill. Rubles	1,748	1,844	1,940
Metal Cutting Machines, NC	Units	7,300	7,937	8,848
Presses—Forging Machines	Thousands	55	55	57
Presses—Forging Machines	Mill. Rubles	507	541	565
OTHER SELECTED PRODUCTS AND INDUSTRIES				
Electric Power	Bill. Kwh	1,202	1,239	1,295
Petroleum	Mill. Tons	572	586	603
Gas	Bill. Cu. Meters	372	407	435
Coal Incl. Coking Coal	Mill. Tons	724	719	716
Pig Iron	Mill. Tons	111	109	107
Steel	Mill. Tons	151	149	148
Rolled Ferrous Metal	Mill. Tons	122	119	118
Steel Pipe	Mill. Meters	NA	2,616	2,609
Steel Pipe	Mill. Tons	18	18	18
Iron Ore	Mill. Tons	244	242	245
Instruments & Automation Equip. with Spare Parts	Mill. Rubles	4,400	4,900	5,400
Computing Equip. with Spare Parts	Mill. Rubles	3,300	3,900	4,500
Automotive Vehicles	Thousands	2,151	2,173	2,199

Source: U.S.S.R. Central Statistical Administration.

As the exchange rate of the ruble is controlled, value figures are given in rubles.

The official exchange rate: 1978 $1 = .680 rubles; 1979 $1 = .654 rubles; 1980 $1 = .649 rubles.

U.S.S.R. PRODUCTION OF MACHINE TOOLS
Units For Selected Years, 1937 to 1980

Year	Metal Cutting Machine Tools	Forging Machines & Presses	Year	Metal Cutting Machine Tools	Forging Machines & Presses
1937	48,500	3,125	1970	202,300	41,268
1940	58,400	4,668	1971	207,000	42,300
1945	38,400	2,871	1972	211,000	44,000
1950	70,600	7,684	1973	214,000	46,500
1955	117,100	17,117	1974	224,000	48,900
1960	155,900	29,933	1975	231,000	50,500
1961	165,000	30,520	1976	232,000	51,900
1962	176,800	33,434	1977	236,000	54,300
1963	182,700	34,221	1978	236,000	55,400
1964	184,400	34,497	1979	231,000	55,200
1965	186,100	34,637	1980	216,000	57,100
1966	192,200	38,412			
1967	197,000	41,126			
1968	200,600	42,128			
1969	205,300	42,658			

Source: The U.S.S.R. in Figures for 1980--U.S.S.R. Central Statistical Administration.

METAL CUTTING (a) MACHINE TOOL PRODUCTION (c)

U.S. and Selected Communist Countries

For selected years, 1960—1979

	1960	1965	1970	1973	1974	1975	1976	1977	1978	1979
United States (b)										
Million US $	$539.30	$1,047.80	$1,097.70	$1,224.70	$1,525.60	$1,790.40	$1,592.20	$1,789.40	$2,139.00	$2,900.00
Thousand units	42.91	68.01	49.31	57.88	69.00	64.32	54.10	59.40	58.12	65.20
Communist Countries										
USSR and Eastern Europe										
USSR										
Million US $	$611.74	$ 931.48	$1,427.88	$1,843.98	$2,025.02	$2,179.78	$2,340.38	$2,556.49	$2,805.78	$2,959.87
Thousand units	155.92	186.13	202.16	213.79	225.59	231.35	232.79	237.56	237.88	229.50
Eastern Europe										
Bulgaria (thousand units)	3.15	8.06	13.94	15.66	15.47	16.28	14.44	13.74	15.32	15.00
Czechoslovakia (thousand units)	30.23	24.33	35.19	31.65	30.19	29.66	31.73	37.61	34.25	36.00
East Germany (thousand units)	41.90	24.77	22.22	19.16	19.11	19.72	19.42	18.76	19.33	20.00
Hungary (thousand units)	9.78	13.85	14.48	9.20	12.67	12.83	14.01	15.27	12.69	14.00
Poland (thousand units)	22.47	31.13	29.73	34.70	33.81	33.19	24.23	23.18	30.00	30.87
Romania (thousand units)	4.44	7.16	14.14	20.55	24.83	28.27	29.95	30.07	27.55	29.00

(a) Power-driven metal cutting machines that are not portable by hand and are used to remove metal in the form of chips; these machines include planers and milling, honing, lapping, grinding, electro-erosion, and ultrasonic cutting machines.

(b) Average value of $1,000 and over for 1960-77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1980".

METAL FORMING MACHINE TOOL (a) PRODUCTION (c)
U.S. and U.S.S.R.
For selected years, 1960—1979

	1960	1965	1970	1973	1974	1975	1976	1977	1978	1979
United States										
Million US$	$238.4	$409.9	$454.1	$563.1	$640.4	$ 615.7	$586.0	$651.3	$784.7	$990.3
Thousand units (b)	19.3	25.3	24.2	30.7	37.0	26.8	26.7	32.5	29.5	30.5
USSR										
Million US$	$188.3	$235.1	$359.2	$480.3	$541.7	$581.1	$664.3	$706.6	$776.7	$828.6
Thousand units	29.9	34.6	41,3	46.5	48.9	50.5	51.9	54.3	55.4	56.5

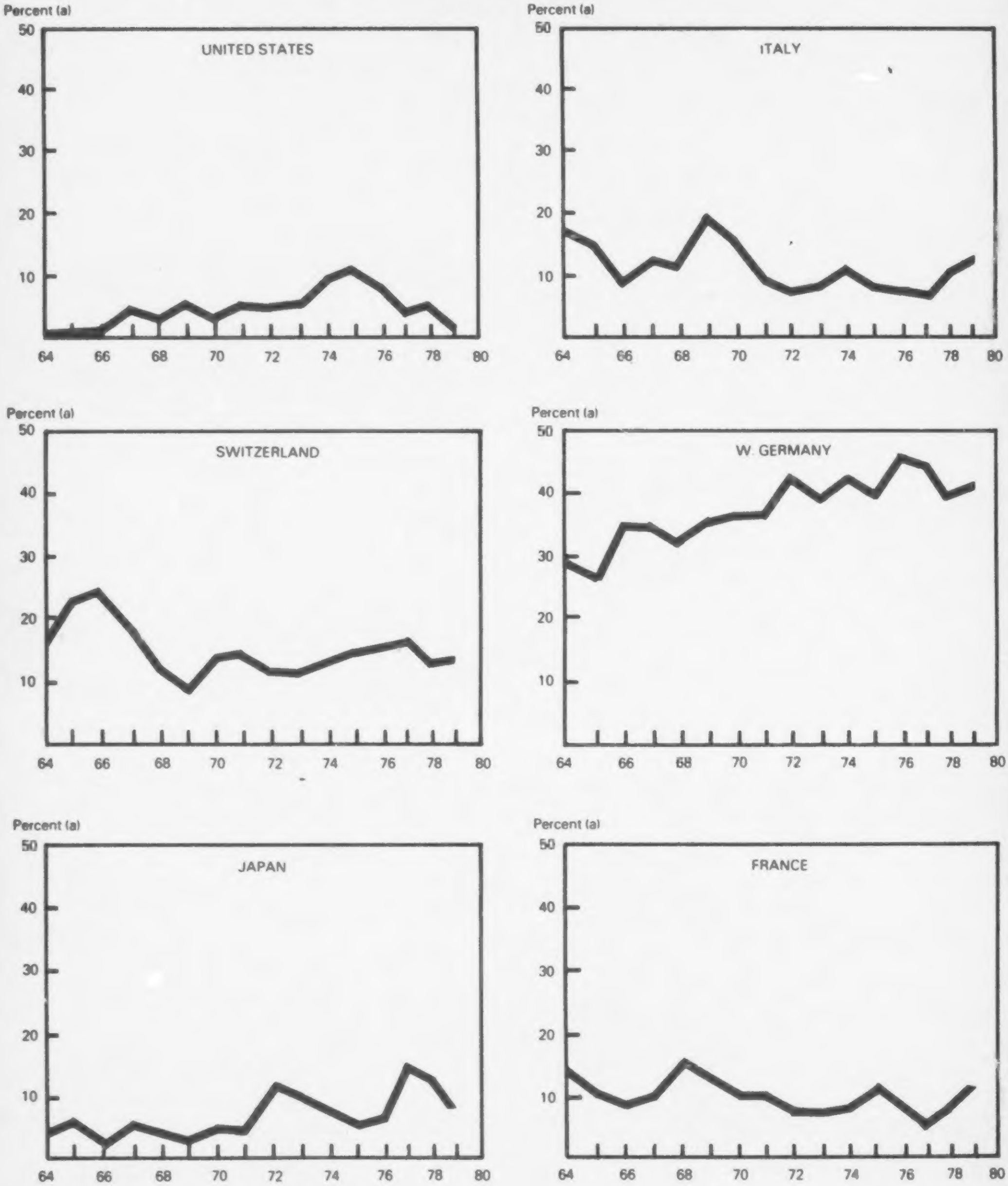
(a) Power-driven metal forming machine tools that are not supported in the hands of an operator when in use and are designed to press, forge, emboss, hammer, extrude, blank, spin, shear, and bend metal into shape.

(b) Average value of $1,000 and over for 1960-77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1980".

EASTERN BLOC MACHINE TOOL IMPORTS
FROM SIX LEADING NON-COMMUNIST NATIONS



(a) Percent of total Eastern Bloc Imports from non communist countries
Source: U.S. Dept. of Commerce
NMTBA

EASTERN BLOC (a) MACHINE TOOL IMPORTS FROM 14 MAJOR NON-COMMUNIST TRADING NATIONS (b)

Total and Selected Nations, 1962 to Date

(Values in Millions of U.S. Dollars)

Year	Total	United States		France		West Germany(e)		Italy		Japan		Switzerland	
		Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)
1962	$ 47.4	$ .5	1.1%	$ 4.0	8.4%	$ 16.2	34.2%	$ 11.3	23.8%	$ 1.0	2.1%	$ 5.7	12.0%
1963	67.4	.3	.4	6.3	9.3	19.0	28.2	12.9	19.1	2.8	4.2	7.7	11.4
1964	68.7	.2	.3	9.0	13.1	19.4	28.2	12.0	17.5	3.1	4.5	10.9	15.9
1965	60.9	.1	.2	6.2	10.2	16.0	26.3	8.5	14.0	4.0	6.6	14.1	23.2
1966	71.3	.5	.7	5.5	7.7	24.6	34.5	6.3	8.8	1.7	2.4	17.7	24.8
1967	93.6	4.3	4.6	10.5	11.2	32.8	35.0	11.6	12.4	6.1	6.5	16.5	17.6
1968	162.7	5.7	3.5	27.9	17.1	49.6	30.5	19.1	11.7	7.6	4.7	17.8	10.9
1969	307.3	18.1	5.9	40.9	13.3	109.3	35.6	61.1	19.9	9.3	3.0	28.7	9.3
1970	257.9	8.0	3.1	24.2	9.4	94.2	36.5	40.3	15.6	12.8	5.0	36.5	14.2
1971	201.2	14.8	7.4	19.8	9.8	75.5	37.5	18.0	8.9	10.2	5.1	29.3	14.6
1972	385.5	21.5	5.6	25.4	6.6	164.3	42.6	28.3	7.3	51.2	13.3	43.6	11.3
1973	597.8	32.6	5.5	36.5	6.1	235.7	39.4	48.6	8.1	63.9	10.7	71.5	12.0
1974	727.4	72.2	9.9	48.6	6.7	309.2	42.5	74.2	10.2	50.4	6.9	89.9	12.4
1975	[illegible]	102.1	11.3	82.1	10.2	355.2	39.5	77.6	8.6	38.7	4.3	125.9	14.0
1976	[illegible]	63.8	9.8	76.6	7.8	447.9	45.9	79.6	8.1	48.3	4.9	138.0	14.1
1977	[illegible]	46.6(d)	4.1	45.6	4.0	504.6	44.7	83.7	7.4	153.7	13.6	144.9	12.8
1978	[illegible]	63.3(e)	4.8	116.7	8.8	536.8	40.3	150.0	11.3	165.9(f)	12.5	145.9	11.0
1979	[illegible]	18.5(d)	1.5	141.9	11.4	534.9	43.0	155.6	12.5	111.8	9.8	145.9	11.7

NA - Not Available.

(a) Bulgaria, Czechoslovakia, E. Germany, Hungary, Poland, Rumania, and U.S.S.R.
(b) United States, Austria, Belgium-Luxembourg, Canada, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, and United Kingdom.
(c) Percent of total Eastern Bloc machine tool imports from non-communist countries.
(d) Does not include Bulgarian imports.
(e) Does not include East German imports.
(f) Does not include Czechoslovakian imports.

Source: U.S. Dept. of Commerce, "Market Share Reports", Commodity Series, Machine Tools For Working Metals; and NMTBA.

COMMUNIST COUNTRIES' EXPORTS OF MACHINERY (a)

1973 to Date

(Millions of U.S. Dollars)

		Exported to					
Exporting Country	Total (b)	Communist Countries (c)	Free Europe (Incl. Yugosl.)	U.S., Canada, Japan	Africa (Excl. S. Afr.)	Asia (d)	Latin America (e)
TOTAL							
1973	$ 9,143	$ 6,917	$638	$48	$298	$ 867	$284
1974	10,606	8,228	759	71	319	986	88
1975	12,401	9,323	929	80	341	1,067	117
1976 (r)	14,050	11,130	580	40	218	687	97
1977	15,605	12,726	665	46	250	786	110
U.S.S.R.							
1973	2,718	1,541	245	3	170	491	182
1974	3,357	2,249	232	10	154	555	11
1975	3553	2,051	252	17	136	540	22
1976 (r)	3,953	2,962	127	3	96	303	23
1977	4,759	3,538	153	3	115	—	28
East Germany							
1973	2,254	1,959	123	11	45	78	37
1974	2,507	2,181	152	12	42	92	26
1975	2,972	2,615	169	9	36	114	24
1976 (r)	3,458	2,957	135	4	50	104	25
1977	3,833	3,328	150	5	54	104	27
Czechoslovakia							
1973	1,774	1,404	128	16	54	134	35
1974	1,973	1,511	169	22	81	153	32
1975	2,303	1,776	195	20	106	162	41
1976 (r)	2,700	2,032	130	8	38	113	28
1977	2,972	2,237	143	9	41	124	32
Poland							
1973	578	438	68	9	10	48	5
1974	641	454	96	17	9	54	10
1975	836	576	145	19	14	63	19
1976 (r)	1,124	855	91	12	12	54	13
1977	1,335	1,015	109	14	14	64	15
Hungary							
1973	587	514	22	1	3	41	6
1974	689	597	35	1	3	49	5
1975	910	749	74	1	5	77	4
1976 (r)	895	752	33	1	3	31	5
1977	1,055	886	38	1	3	37	6
Romania							
1973	388	269	34	7	11	59	8
1974	437	293	49	8	22	61	3
1975	561	372	58	13	30	83	4
1976 (r)	440	215	37	13	15	58	2
1977	495	242	42	14	16	65	2
Bulgaria							
1973	844	792	18	1	5	16	11
1974	1,002	943	26	1	8	22	1
1975	1,266	1,185	36	1	13	30	1
1976 (r)	1,481	1,358	27	1	6	23	1
1977	1,615	1,480	30	1	6	26	1

r - Revised.

(a) Note that these figures are for machinery in general and not for machine tools only.

(b) Total includes Australia, New Zealand, South Africa and not specified.

(c) U.S.S.R., East Germany, Czechoslovakia, Poland, Hungary, Romania, Bulgaria, Albania; beginning with 1974 includes Cuba and Outer Mongolia.

(d) Excluding Japan; beginning with 1974 excludes Outer Mongolia.

(e) Beginning with 1974 excludes Cuba.

Source: Verein Deutscher Maschinenbau-Anstalten, VDMA, "Statistisches Handbuch für den Maschinenbau" (annually).

7

EMPLOYMENT AND EARNINGS

If all the employees of the U.S. machine tool industry were to work for a single company, it would rank only about twentieth among U.S. industrial corporations in total employment.

The industry is small, characterized by a substantial number of small and medium-sized establishments.

Employment fluctuates sharply with the fluctuations in new orders and shipments. Evidence of this is provided not only by the employment statistics but also by the labor turnover data in this chapter. These fluctuations create serious problems for the industry and for its employees. If employment has to be cut drastically, some of the highly skilled labor force is lost. When business experiences a quick upturn, there is a shortage of skilled workers. Extensive overtime is characteristic of the industry when orders are high.

To fill the gap in skilled workers, the industry sponsors training programs and NMTBA's Training Director assists Association members in solving a variety of manpower problems. However, the work force is getting older and it is becoming increasingly difficult to maintain a core of skilled workers.

Wages in the industry are competitive with those in comparable industries. Average hourly earnings for production workers in the metal cutting machine tool segment were $9.16 in 1981. Average earnings in the metal forming sector of the industry were $9.28. The average weekly hours worked by employees in the industry were 42.0 for metal cutting workers and 39.3 for metal forming workers.

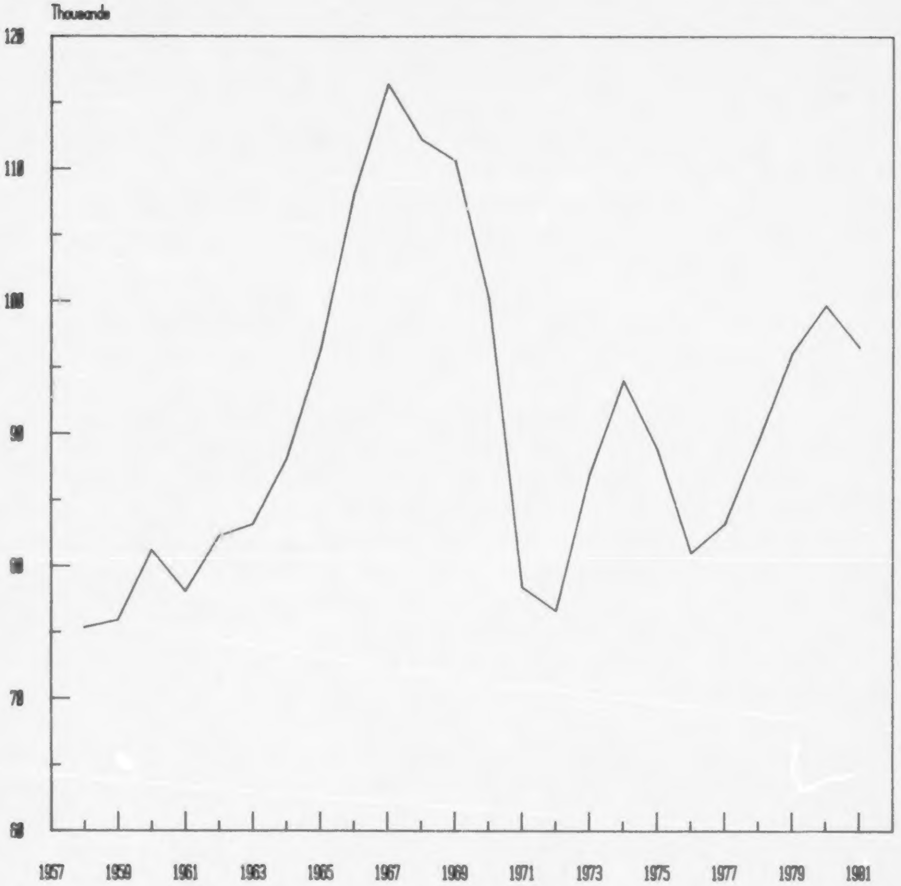
Work injury rates in metal cutting machine tool establishments are substantially lower, in lost workday cases, than the average for all manufacturing industries. The NMTBA Safety Director works closely with government agencies, industry members, and major industry customers to solve problems affecting safety and health.

Total compensation in the metal and metalworking industries in other countries has grown more rapidly than in the U.S. and in some cases is approaching equivalence. When the focus is narrowed to machine tools only, the total compensation of workers in the U.S. machine tool industry is still the highest among the major machine tool producing nations.

Most of the data in this chapter comes from the U.S. Bureau of Labor Statistics; some is from the U.S. Bureau of the Census. The regular Census data are based on complete enumerations of all workers covered; most other data are based on sample surveys. For definitions and further explanations of the terms used in this chapter see the Glossary at the end of this book.

EMPLOYMENT IN THE MACHINE TOOL INDUSTRY

1958 TO DATE



Note: Estimate by NMTBA for 1977 and 1978

Sources U.S. Bureau of the Census. "Census of Manufactures" and
"Annual Survey of Manufactures"

EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
1937 to Date

	Machine Tool Total		Metal Cutting		Metal Forming	
Year	All Employees	Production Workers	All Employees	Production Workers	All Employees	Production Workers
1937	NA	NA	NA	37,477	NA	NA
1939	NA	NA	NA	36,997	NA	NA
1947	NA	NA	70,001	54,435	NA	NA
1949	NA	NA	52,384	38,584	NA	NA
1950	NA	NA	54,747	41,555	NA	NA
1951	NA	NA	83,855	64,029	NA	NA
1952	NA	NA	102,735	79,471	NA	NA
1953	NA	NA	99,494	76,840	NA	NA
1954	NA	NA	80,959	62,106	NA	NA
1955	NA	NA	77,063	58,600	NA	NA
1956	NA	NA	85,469	65,208	NA	NA
1957	NA	NA	79,895	59,600	NA	NA
1958	75,366	51,726	52,864	36,154	22,502	15,572
1959	75,091	53,332	52,797	35,436	22,294	17,896
1960	81,200	57,439	58,777	39,487	22,423	17,952
1961	78,108	54,633	54,901	36,373	23,207	18,260
1962	82,251	57,662	58,855	39,253	23,396	18,409
1963	83,136	56,790	61,058	41,008	22,078	15,782
1964	88,079	61,196	65,078	44,471	23,001	16,725
1965	96,334	67,257	70,827	48,745	25,517	18,512
1966	108,174	76,190	79,767	55,279	28,407	20,911
1967	116,400	81,400	87,200	60,500	29,200	20,900
1968	112,200	76,900	84,300	57,500	27,900	19,400
1969	110,600	74,700	82,600	55,300	28,000	19,400
1970	100,200	65,900	71,300	45,800	28,900	20,100
1971	78,400	49,200	54,000	33,200	24,400	16,000
1972	76,600	50,000	52,500	33,400	24,100	16,600
1973	86,900	58,700	59,900	39,800	27,000	18,900
1974	94,000	64,200	65,000	43,900	29,000	20,300
1975	88,800	58,500	62,800	40,800	26,000	17,700
1976	81,000	53,500	58,100	37,600	22,900	15,900
1977	83,200	53,400	59,500	37,300	23,700	16,100
1978	89,500	59,200	64,300	42,200	25,200	17,000
1979(r)	96,100	64,400	69,100	45,700	27,000	18,700
1980(r)	99,700	66,000	72,800	47,800	26,900	18,200
1981E	96,535	63,945	70,470	46,299	26,065	17,646

NA - Not Available. E - Estimate by NMTBA. r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures".

EMPLOYMENT AND COMPENSATION
Machine Tool Industry
Selected Years

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	81,200	$ 523.0	57,439	116.7	$ 324.7
1962	82,251	573.8	57,662	118.2	344.5
1964	88,079	678.0	61,196	135.2	428.4
1966	108,174	918.3	76,190	171.2	591.7
1968	112,200	1,001.0	76,900	163.1	619.7
1969	110,600	1,062.2	74,700	158.4	649.5
1970	100,200	965.3	65,900	136.6	572.6
1971	78,400	774.6	49,200	97.4	428.7
1972	76,600	839.2	50,000	103.3	489.7
1973	86,900	1,033.0	58,700	125.1	623.0
1974	94,000	1,245.2	64,200	135.8	748.0
1975	88,800	1,193.4	58,500	117.5	695.2
1976	81,000	1,182.2	53,500	105.5	688.1
1977	83,200	1,311.7	53,400	109.4	761.6
1978	89,500	1,536.3	59,200	123.3	932.8
1979	96,100	1,789.7	64,400	133.4	1,092.0
1980	99,700	2,018.1	66,000	134.0	1,202.7

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufacturers".

EMPLOYMENT AND COMPENSATION
Metal Forming Machine Tool Industry
Selected Years

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	22,423	$ 152.1	17,952	35.8	$ 100.9
1962	23,396	172.0	18,409	37.0	109.5
1964	23,001	180.3	16,725	37.9	121.6
1966	28,407	244.9	20,911	47.4	164.2
1968	27,900	245.8	19,400	42.9	157.4
1969	28,000	270.6	19,400	42.4	172.0
1970	28,900	280.6	20,100	43.4	177.3
1971	24,400	241.5	16,000	32.9	142.5
1972	24,100	265.4	16,600	34.7	163.8
1973	27,000	323.6	18,900	41.8	205.1
1974	29,000	370.8	20,300	43.3	238.2
1975	26,000	343.1	17,700	35.8	208.2
1976	22,900	336.8	15,900	32.0	214.2
1977	23,700	360.7	16,100	32.8	219.4
1978(r)	25,200	415.6	17,000	35.1	253.2
1979(r)	27,000	485.6	18,700	37.5	305.1
1980	26,900	514.1	18,200	35.2	313.2

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures".

EMPLOYMENT AND COMPENSATION
Metal Cutting Machine Tool Industry
1937 to Date

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-Hours (Million)	Wages (Million $)
1937	NA	NA	37,477	NA	$ 62.6
1939	NA	NA	36,997	NA	62.9
1947	70,001	$ 234.0	54,435	113.4	165.0
1949	52,384	190.4	38,584	74.5	120.0
1950	54,747	226.8	41,555	88.6	150.6
1951	83,855	396.4	64,029	155.7	281.0
1952	102,735	524.5	79,471	194.6	385.3
1953	99,494	537.6	76,840	175.3	392.6
1954	80,959	432.3	62,106	133.2	302.7
1955	77,063	426.6	58,600	128.1	297.2
1956	85,469	511.9	65,200	147.5	360.6
1957	79,895	470.9	59,600	125.4	319.3
1958	52,864	300.3	35,154	69.6	182.2
1959	52,797	329.5	36,436	72.2	202.0
1960	58,777	370.9	39,487	80.9	223.8
1961	54,901	353.0	36,373	72.7	201.5
1962	58,855	401.8	39,253	81.2	235.0
1963	61,058	438.2	41,008	86.5	272.2
1964	65,078	497.7	44,471	97.3	306.8
1965	70,827	565.0	48,745	108.1	353.7
1966	79,767	673.4	55,279	123.8	427.5
1967	87,200	759.9	60,500	131.8	476.5
1968	84,300	755.2	57,500	120.2	462.3
1969	82,600	791.6	55,300	116.0	477.5
1970	71,300	684.7	45,800	93.2	395.3
1971	54,000	533.1	33,200	64.5	286.2
1972	52,500	573.8	33,400	68.2	325.9
1973	59,900	709.4	39,800	83.3	417.9
1974	65,000	874.4	43,900	92.5	509.8
1975	62,800	850.3	40,800	81.7	486.8
1976	58,100	845.4	37,600	73.5	473.9
1977	59,500	951.0	37,300	76.6	542.2
1978	64,300	1,120.7	42,200	88.2	679.6
1979	69,100	1,304.1	45,700	95.9	786.9
1980	72,800	1,504.0	47,800	98.8	889.5

NA - Not Available.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures".

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS
Metal Cutting Machine Tool Industry
Monthly, 1979 to Date

	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
Month	1979 (r)	1980 (r)	1981	1979	1980 (r)	1981
Jan.	47.7	55.1	53.2	45.1	44.9	43.8
Feb.	48.7	55.4	52.6	45.0	45.0	43.1
Mar.	49.1	55.4	52.5	44.9	44.4	43.4
Apr.	51.2	55.7	52.3	42.6	44.0	42.1
May	51.1	56.0	51.5	43.8	43.9	40.1
June	51.5	54.8	51.6	44.0	43.5	42.2
July	51.1	55.0	50.9	42.6	41.1	41.4
Aug.	51.0	53.2	50.2	43.5	42.2	41.5
Sept.	51.8	52.6	51.0	44.3	43.1	41.4
Oct.	52.5	52.7	50.2	44.7	43.1	41.3
Nov.	53.0	53.6	48.4	45.0	44.0	41.5
Dec.	55.2	53.5	47.6	45.7	45.0	42.1
Yearly Avg.	51.2	54.4	51.0	44.3	43.7	42.0

r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

LABOR TURNOVER IN THE METAL CUTTING MACHINE TOOL INDUSTRY
1959 to Date

	Total Accessions	Total Separations	New Hires	Quits	Layoffs
Year	Per 100 Employees (a)				
1959	3.4	1.9	1.5	.7	.8
1960	1.9	2.4	1.3	.7	1.2
1961	2.0	1.9	1.1	.6	.9
1962	2.0	1.7	1.5	.8	.5
1963	1.8	1.6	1.5	.7	.4
1964	2.2	1.6	1.9	.9	.2
1965	2.5	1.8	2.3	1.2	.1
1966	3.1	2.4	2.9	1.7	.1
1967	2.4	2.3	2.1	1.5	.2
1968	1.8	2.4	1.5	1.4	.5
1969	2.3	2.3	2.0	1.4	.3
1970	1.4	4.0	.9	.9	2.4
1971	1.7	2.8	.6	.6	1.7
1972	2.6	2.0	1.6	.9	.5
1973	3.2	2.3	2.9	1.4	.1
1974	2.4	2.1	2.2	1.3	.2
1975	1.1	2.5	.6	.6	1.3
1976	1.9	1.6	1.0	.6	.5
1977	1.9	1.7	1.5	.8	.4
1978(r)	2.1	1.7	1.8	.9	.2
1979(r)	2.4	1.7	2.1	1.0	.1
1980	1.6	1.5	1.4	.7	.3
1981	1.0	1.6	.8	.6	.6

(a) Data relates to "All Employees".

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics. 1909-70" (also monthly).

EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY
Monthly, 1980 to Date
(Employment in Thousands)

Month	1980 (r)	% Change 1980:1979	1981	% Change 1981:1980
Jan.	81.4	+10.7	80.7	−0.9
Feb.	82.0	+9.9	80.3	−2.1
Mar.	82.1	+9.0	80.3	−2.2
Apr.	82.7	+8.7	80.0	−3.3
May	83.1	+9.3	79.3	−4.6
June	81.9	+6.1	79.6	−2.8
July	82.6	+7.4	79.1	−4.2
Aug.	80.4	+4.3	78.5	−2.4
Sept.	79.3	+2.2	78.9	−0.5
Oct.	79.6	+1.3	78.2	−1.8
Nov.	81.1	+2.0	75.8	−6.5
Dec.	80.9	+1.3	75.1	−7.2
Yearly Avg.	81.4	+5.9	78.8	−3.2

r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY
1958 to Date
(Employment in Thousands)

Annual Average Year	All Employees	Production Workers	Female Employees
1958	64.7	43.8	6.3
1959	64.8	44.3	6.0
1960	69.5	48.2	6.5
1961	63.3	42.8	5.9
1962	63.7	43.7	5.8
1963	63.6	44.0	5.7
1964	67.1	46.7	5.8
1965	72.8	50.8	6.2
1966	79.4	55.7	7.1
1967	83.3	57.9	7.9
1968	80.0	54.5	7.6
1969	77.4	52.2	7.4
1970	69.2	45.5	6.8
1971	54.9	34.9	5.4
1972	55.8	35.8	5.5
1973	63.7	42.6	6.4
1974	67.8	45.6	7.1
1975	63.3	41.8	6.6
1976	59.9	38.8	6.4
1977	65.2	41.9	7.3
1978(r)	70.9	45.9	8.4
1979(r)	77.4	51.2	9.7
1980(r)	81.4	54.4	10.5
1981(p)	78.8	51.0	10.5

r - Revised. p - Preliminary.

Note: The figures published by the Bureau of Labor Statistics are based on sample surveys and differ from the figures shown by the Census.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-70" (also monthly).

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS
Metal Forming Machine Tool Industry
Monthly, 1979 to Date

	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
Month	1979	1980	1981	1979	1980	1981
Jan.	17.3	18.1	15.8	42.3	42.8	40.2
Feb.	17.5	18.0	15.6	43.1	42.6	40.1
Mar.	17.6	18.0	15.5	43.4	43.6	40.0
Apr.	17.6	18.0	15.3	41.1	41.5	39.7
May	17.5	17.5	15.4	42.6	41.8	40.1
June	17.8	17.4	15.4	42.7	40.9	39.7
July	17.7	16.8	15.2	41.1	38.8	37.6
Aug.	17.4	16.5	14.3	40.0	39.5	38.2
Sept.	17.7	16.2	14.4	42.4	40.1	39.1
Oct.	17.8	15.8	15.3	42.6	40.1	38.4
Nov.	18.0	15.9	15.3	42.7	40.9	39.3
Dec.	18.1	15.9	15.4	43.4	40.6	39.0
Yearly Avg.	17.7	17.0	15.2	42.3	41.1	39.3

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

EMPLOYMENT IN THE METAL FORMING MACHINE TOOL INDUSTRY
1977 to Date
(Employment in Thousands)

Annual Average Year	All Employees	Production Workers	Female Employees
1977	23.3	15.4	NA
1978	25.0	16.5	NA
1979	26.9	17.7	NA
1980	26.4	17.0	NA
1981	24.3	15.2	NA

Note: The figures published by the Bureau of Labor Statistics are based on sample surveys and differ from the figures shown by the Census.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (annual and monthly).

HOURS AND GROSS EARNINGS OF PRODUCTION WORKERS
Metalworking and Metal Cutting Industries, 1935 to Date

	Metalworking Machinery Industry			Metal Cutting Machine Tool Industry		
Year	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
1935	NA	NA	NA	$ 26.09	40.9	$ .64
1936	NA	NA	NA	28.73	44.4	.65
1937	NA	NA	NA	32.48	44.8	.73
1938	NA	NA	NA	26.75	36.0	.74
1939	NA	NA	NA	32.34	42.5	.76
1940	NA	NA	NA	37.44	48.0	.78
1941	NA	NA	NA	44.22	51.6	.86
1942	NA	NA	NA	52.70	53.5	.99
1943	NA	NA	NA	55.11	50.7	1.09
1944	NA	NA	NA	58.19	50.6	1.15
1945	NA	NA	NA	57.14	47.9	1.19
1946	NA	NA	NA	54.40	42.8	1.27
1947	$ 58.69	42.5	$ 1.38	57.87	42.3	1.37
1948	63.13	42.4	1.49	61.68	42.1	1.47
1949	61.33	39.8	1.54	59.23	39.2	1.51
1950	71.73	43.5	1.65	69.87	43.1	1.62
1951	86.01	47.4	1.83	85.14	47.3	1.80
1952	92.20	46.8	1.97	90.24	47.0	1.92
1953	96.81	46.1	2.10	95.17	46.2	2.06
1954	93.09	42.9	2.17	89.25	42.5	2.10
1955	98.34	43.9	2.24	95.48	43.6	2.19
1956	108.96	45.4	2.40	106.25	45.6	2.33
1957	106.89	43.1	2.48	101.04	42.1	2.40
1958	102.00	40.0	2.55	91.20	38.0	2.40
1959	113.74	42.6	2.67	106.93	42.1	2.54
1960	117.27	42.8	2.74	110.99	42.2	2.63
1961	117.04	41.8	2.80	111.92	41.3	2.71
1962	125.57	43.3	2.90	119.41	42.8	2.79
1963	128.90	43.4	2.97	124.42	43.2	2.88
1964	137.06	44.5	3.08	132.01	44.3	2.98
1965	144.37	45.4	3.18	138.76	45.2	3.07
1966	153.72	46.3	3.32	150.20	46.5	3.23
1967	154.56	44.8	3.45	154.25	45.5	3.39
1968	158.70	43.6	3.64	152.65	43.0	3.55
1969	172.38	44.2	3.90	166.61	43.5	3.83
1970	174.28	42.3	4.12	166.00	41.5	4.00
1971	174.62	40.8	4.28	163.90	39.4	4.16
1972	198.29	43.2	4.59	194.71	42.7	4.56
1973	214.90	44.4	4.84	219.11	44.9	4.88
1974	225.33	43.5	5.18	232.74	44.5	5.23
1975	226.46	41.1	5.51	232.68	42.0	5.54
1976	248.89	41.9	5.94	249.96	41.8	5.98
1977	279.72	43.1	6.49	290.18	43.9	6.61
1978	308.88	44.0	7.02	322.56	44.8	7.20
1979(r)	329.30	43.5	7.57	344.21	44.3	7.77
1980(r)	348.08	42.5	8.19	366.64	43.7	8.39
1981	373.58	41.7	8.98	386.33	42.0	9.16

NA - Not Available. r - Revised.

Note: Earnings figures include overtime and premium pay.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-70" (also monthly).

AVERAGE WEEKLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1935 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1935	$ 21.24	NA	$ 27.29	NA	NA	$ 26.09
1936	23.72	NA	30.13	NA	NA	28.73
1937	26.61	NA	32.66	NA	NA	32.48
1938	23.70	NA	30.59	NA	NA	26.75
1939	26.19	NA	33.58	NA	NA	32.34
1940	28.07	NA	36.69	NA	NA	37.44
1941	33.56	NA	42.68	NA	NA	44.22
1942	42.17	NA	54.15	NA	NA	52.70
1943	48.73	NA	59.13	NA	NA	55.11
1944	51.38	NA	60.12	NA	NA	58.19
1945	48.36	NA	55.28	NA	NA	57.14
1946	46.22	NA	52.28	NA	NA	54.40
1947	51.76	$ 57.58	58.63	$ 54.74	$ 58.69	57.87
1948	56.36	60.38	63.15	60.97	63.13	61.68
1949	57.25	60.31	67.33	63.34	61.33	59.23
1950	62.43	67.08	74.85	68.10	71.73	69.87
1951	68.48	76.13	77.16	77.96	86.01	85.14
1952	72.63	79.55	84.87	81.27	92.20	90.24
1953	76.63	82.68	89.88	83.38	96.81	95.17
1954	76.19	81.40	91.30	84.66	93.09	89.25
1955	82.19	87.36	99.84	89.21	98.34	95.48
1956	85.28	93.06	96.82	95.57	108.96	106.25
1957	88.26	94.12	100.61	96.35	106.89	101.04
1958	89.27	94.33	101.24	101.25	102.00	91.20
1959	96.05	102.92	111.38	106.63	113.74	106.93
1960	97.44	104.55	115.21	110.43	117.27	110.99
1961	100.35	107.42	114.65	114.68	117.04	111.92
1962	104.70	113.01	127.67	119.97	125.57	119.41
1963	108.09	116.20	132.68	122.43	128.90	124.42
1964	112.19	121.69	138.03	125.03	137.06	132.01
1965	117.18	127.58	147.63	131.88	144.37	138.76
1966	122.09	135.34	147.23	143.32	153.72	150.20
1967	123.60	135.89	144.84	146.97	154.56	154.25
1968	132.07	141.88	167.66	152.04	158.70	152.65
1969	139.59	152.15	170.56	161.35	172.38	166.61
1970	143.47	154.95	170.47	168.92	174.28	166.00
1971	153.52	161.99	195.29	175.82	174.62	163.90
1972	167.27	179.34	219.22	193.44	198.29	194.71
1973	179.28	193.83	237.08	207.50	214.90	219.11
1974	190.48	207.62	239.54	218.70	225.33	232.74
1975	205.09	219.22	262.68	246.19	226.46	232.68
1976	225.33	236.74	305.30	263.16	248.89	249.96
1977	248.46	259.79	345.40	289.95	279.72	290.18
1978	270.44	285.44	368.05	318.19	308.88	322.56
1979(r)	290.90	305.98	372.37	351.05	329.30	344.21
1980(r)	310.78	328.00	391.42	389.76	348.08	366.64
1981	342.50	361.15	447.04	425.80	373.15	386.13

NA - Not Available. r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-70" (also monthly).

AVERAGE HOURLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1935 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1935	$ .57	NA	$ .72	NA	NA	$ .64
1936	.58	NA	.76	NA	NA	.65
1937	.67	NA	.88	NA	NA	.73
1938	.68	NA	.91	NA	NA	.74
1939	.69	NA	.92	NA	NA	.76
1940	.72	NA	.94	NA	NA	.78
1941	.80	NA	1.04	NA	NA	.86
1942	.94	NA	1.17	NA	NA	.99
1943	1.05	NA	1.24	NA	NA	1.09
1944	1.11	NA	1.27	NA	NA	1.15
1945	1.10	NA	1.27	NA	NA	1.19
1946	1.14	NA	1.35	NA	NA	1.27
1947	1.28	$ 1.34	1.47	$ 1.37	$ 1.38	1.37
1948	1.40	1.46	1.61	1.49	1.49	1.47
1949	1.45	1.52	1.70	1.56	1.54	1.51
1950	1.52	1.60	1.78	1.64	1.65	1.62
1951	1.65	1.75	1.91	1.78	1.83	1.80
1952	1.75	1.85	2.05	1.89	1.97	1.92
1953	1.86	1.95	2.14	1.99	2.10	2.06
1954	1.90	2.00	2.20	2.07	2.17	2.10
1955	1.99	2.08	2.29	2.16	2.24	2.19
1956	2.08	2.20	2.35	2.27	2.40	2.33
1957	2.19	2.29	2.46	2.35	2.48	2.40
1958	2.26	2.37	2.55	2.50	2.55	2.40
1959	2.36	2.48	2.71	2.62	2.67	2.54
1960	2.43	2.55	2.81	2.70	2.74	2.63
1961	2.49	2.62	2.86	2.77	2.80	2.71
1962	2.56	2.71	2.99	2.87	2.90	2.79
1963	2.63	2.78	3.10	2.95	2.97	2.88
1964	2.71	2.87	3.21	3.02	3.08	2.98
1965	2.79	2.96	3.34	3.14	3.18	3.07
1966	2.90	3.09	3.44	3.31	3.32	3.23
1967	3.00	3.19	3.55	3.45	3.45	3.39
1968	3.19	3.37	3.89	3.62	3.64	3.55
1969	3.38	3.58	4.10	3.86	3.90	3.83
1970	3.56	3.77	4.23	4.12	4.12	4.00
1971	3.80	3.99	4.74	4.32	4.28	4.16
1972	4.05	4.27	5.11	4.65	4.59	4.56
1973	4.32	4.55	5.45	5.00	4.84	4.88
1974	4.68	4.92	5.90	5.40	5.18	5.23
1975	5.14	5.36	6.47	5.99	5.51	5.54
1976	5.55	5.76	7.10	6.45	5.94	5.98
1977	6.06	6.26	7.85	6.92	6.49	6.61
1978(r)	6.58	6.78	8.50	7.54	7.02	7.20
1979(r)	7.13	7.32	9.06	8.26	7.57	7.77
1980(r)	7.75	8.00	9.81	9.28	8.19	8.39
1981	8.52	8.83	10.93	10.31	8.97	9.15

NA - Not Available. r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-70" (also monthly).

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1974-75, 1978, 1981

	Occupation				
	Machine Tool Operators, Production				
Region and Survey Year	Class A (b)	Class B (c)	Class C (d)	Numerically Controlled	Tool Room One Type Machine
1. Baltimore, Md.					
Winter 1974-75	$ 5.17	$ 4.60	$ 3.97	$ 5.06	$ 5.21(e)
Jan. 1978	6.74	5.79	5.24	5.67	6.54(e)
Jan. 1981	9.01	7.84	7.01	7.68	NA
2. Boston, Mass.					
Winter 1974-75	5.04	4.15	3.58	4.66	5.76
Jan. 1978	6.54	6.01	4.71	6.24	6.72
Jan. 1981	8.59	8.35	5.87	8.44	NA
3. Buffalo, N.Y.					
Winter 1974-75	5.16	4.78	4.19	5.56	5.43
Jan. 1978	6.77	6.28	5.44	7.00	6.80
Jan. 1981	8.97	8.25	7.01	9.47	7.74
4. Chicago, Ill.					
Winter 1974-75	5.71	5.02	4.49	5.59	6.20
Jan. 1978	7.38	6.51	5.90	7.55	8.36
Jan. 1981	9.60	8.00	6.63	9.51	11.31
5. Cleveland, Ohio					
Winter 1974-75	5.68	4.75	3.84	5.68	5.80
Jan. 1978	7.02	6.01	4.12	7.17	7.09
Jan. 1981	9.43	8.13	6.78	9.37	9.66
6. Denver, Colo.					
Winter 1974-75	5.53	4.43	3.78	5.34	5.84(e)
Jan. 1978	6.60	5.36	5.04	6.44	6.63
Jan. 1981	9.30	7.23	NA	8.28	10.69
7. Detroit, Mich.					
Winter 1974-75	6.07	5.46	4.42	6.29	6.68
Jan. 1978	8.19	7.01	5.48	7.14	8.94
Jan. 1981	11.61	9.48	6.21	9.44	12.08
8. Houston, Tx.					
Winter 1974-75	5.40	5.01	3.91	5.50	5.31
Jan. 1978	7.15	6.66	4.89	7.29	7.26
Jan. 1981	9.92	NA	5.93	10.08	10.08
9. L.A.-Long Beach, Cal.					
Winter 1974-75	5.28	4.56	3.60	5.43	6.17
Jan. 1978	6.87	5.45	3.96	6.86	7.44
Jan. 1981	9.38	7.39	4.83	9.28	9.87
10. Milwaukee, Wis.					
Winter 1974-75	5.75	5.48	5.49	5.48	5.89
Jan. 1978	7.78	6.89	NA	7.43	7.86
Jan. 1981	10.47	9.91	8.45	10.36	11.35
11. Newark, N.J.					
Winter 1974-75	5.31	5.31	3.86	5.61	5.71
Jan. 1978	6.50	6.59	4.85	6.29	7.47
Jan. 1981	9.44	9.04	6.35	7.68	NA
12. Pittsburgh, Pa.					
Winter 1974-75	5.55	5.36	4.97	5.19	5.43
Jan. 1978	7.15	6.71	6.15	6.69	7.21(e)
Jan. 1981	9.44	8.80	8.14	9.33	NA
13. St. Louis, Mo.-Ill.					
Winter 1974-75	6.54	5.07	4.69	6.33	5.76
Jan. 1978	8.25	6.14	6.12	7.26	8.03
Jan. 1981	9.45	8.36	8.30	9.27	8.69

NA - Not Available.

(a) Nonelectrical Machinery (SIC 35).

(b) Operators who set up their own machines and perform a variety of machine operations to close tolerances using decisions based on blueprints and layouts.

(c) Operators who set up their own machines and maintain operation set-ups made by others.

(d) Operators who perform routine and repetitive operations but do not set up machines.

(e) More than one type of machine.

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1974-75, 1978, 1981

(Continued)

	Occupation					
	Assemblers		Inspectors		Laborers, Material Handling	Tool Clerks
	Class A (f)	Class B (g)	Class A (h)	Class B (i)		
1.						
	$ 4.86	$ 4.39	$ 5.46	NA	$ 3.67	$ 4.07
	6.03	5.71	6.72	NA	5.13	5.38
	8.00	6.88	8.88	$ 7.72	7.21	NA
2.						
	4.86	3.97	4.97	4.32	3.66	4.52
	6.18	4.89	NA	5.26	4.56	5.73
	8.31	6.62	8.47	7.44	6.18	7.22
3.						
	5.29	4.73	5.54	5.04	4.36	4.43
	6.92	6.43	7.20	6.36	NA	5.86
	9.24	8.07	9.35	7.62	8.11	7.80
4.						
	5.35	4.58	5.51	5.15	4.30	4.68
	6.84	6.49	7.43	6.80	5.86	6.47
	8.95	7.43	9.25	8.56	6.81	9.10
5.						
	5.57	4.95	5.60	5.26	4.49	4.96
	7.21	6.13	7.20	6.65	6.07	6.50
	9.64	7.80	9.93	8.46	8.90	8.86
6.						
	4.90	3.81	5.14	4.03	3.58	4.38
	5.94	4.30	6.67	5.93	4.75	5.89
	7.79	5.40	8.55	7.04	5.89	7.54
7.						
	6.15	5.60	5.74	5.65	4.79	5.44
	7.80	7.23	7.79	6.50	6.94	7.13
	11.17	9.59	11.01	NA	9.45	9.80
8.						
	5.27	4.47	5.43	4.60	4.21	4.65
	6.89	5.86	7.37	6.43	5.38	6.36
	9.75	9.06	10.07	8.45	7.41	7.80
9.						
	4.71	3.88	5.38	4.30	3.82	4.58
	6.29	4.41	6.74	5.50	4.67	5.24
	8.02	6.09	9.77	7.20	5.74	6.93
10.						
	5.68	5.24	5.64	5.40	NA	4.77
	7.72	6.96	7.24	6.97	6.19	6.28
	10.31	9.09	9.99	NA	8.88	9.13
11.						
	5.28	4.21	4.87	4.92	4.02	4.85
	6.54	5.71	5.95	6.61	4.96	5.74
	7.93	5.90	7.83	7.77	7.21	6.60
12.						
	5.80	4.48	6.19	4.99	4.47	4.65
	7.14	6.02	7.37	6.66	5.33	6.18
	8.52	7.78	9.44	8.79	8.74	7.48
13.						
	5.78	4.70	6.23	5.03	4.17	4.62
	6.91	5.81	7.24	6.23	5.11	5.81
	9.10	7.57	9.04	8.35	6.79	7.86

(f) Fits and adjusts parts and makes decisions regarding proper performance of component or unit.

(g) Assembles parts in accordance with standard and prescribed procedures. Requires some fitting and adjusting.

(h) Responsible for decisions regarding quality of product and operations. Troubleshooting and interpreting of drawings and specifications is involved.

(i) Tests products and processes having rigid specifications with established inspection procedures.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

SELECTED LABOR RATIOS
1960 to Date

	Payroll per Employee	Prod. Wkrs. % of Total Employment	Annual Man-Hours of Prod. Workers	Average Hourly Earnings, Prod.Workers	Value Added Per Employee	Payroll as % of Value Added	Value Added per Man Hour of Prod. Wkrs.
METAL CUTTING MACHINE TOOL INDUSTRY							
1960	$ 6,310	67%	2,049	$2.77	$ 9,837	64%	$ 7.15
1961	6,429	66	1,999	2.77	10,020	64	7.57
1962	6,827	67	2,069	2.89	11,401	60	8.26
1963	7,171	67	2,109	3.14	11,445	62	8.08
1964	7,645	68	2,186	3.15	12,844	59	8.59
1965	7,980	68	2,219	3.27	14,033	56	9.19
1966	8,438	69	2,238	3.45	15,466	54	9.96
1967	8,714	69	2,178	3.61	15,955	54	10.55
1968	8,958	68	2,090	3.84	16,335	54	11.45
1969	9,583	66	2,097	4.11	17,451	54	12.42
1970	9,603	64	2,034	4.24	15,597	61	11.93
1971	9,872	61	1,942	4.43	15,181	65	12.71
1972	10,929	63	2,041	4.77	17,175	63	13.22
1973	11,843	66	2,092	5.01	20,268	58	14.57
1974	13,452	67	2,107	5.51	24,876	54	17.48
1975	13,539	64	2,002	5.95	26,119	51	20.07
1976	14,550	64	1,954	6.44	28,641	50	22.64
1977	15,983	65	2,054	7.08	31,445	51	24.43
1978	17,429	66	2,090	7.71	35,257	49	25.70
1979	18,873	66	2,098	8.21	41,010	46	29.55
1980(p)	20,659	66	2,067	9.00	46,005	45	33.90
METAL FORMING MACHINE TOOL INDUSTRY							
1960	$ 6,785	80%	1,996	$2.82	$10,596	64%	$ 6.63
1961	6,818	79	1,905	2.91	9,552	71	6.37
1962	7,351	79	2,012	2.96	11,363	65	7.18
1963	7,316	71	2,189	3.10	12,728	57	8.13
1964	7,839	72	2,269	3.20	13,847	56	8.40
1965	8,058	72	2,243	3.34	13,686	58	8.40
1966	8,623	73	2,267	3.46	15,214	56	9.11
1967	8,547	71	2,210	3.57	14,972	57	9.46
1968	8,810	69	2,211	3.66	16,247	54	10.56
1969	9,664	69	2,185	4.05	16,182	59	10.68
1970	9,709	69	2,159	4.08	16,249	59	10.82
1971	9,897	65	2,056	4.33	14,913	66	11.06
1972	11,012	68	2,090	4.72	17,331	63	12.03
1973	11,985	70	2,211	4.90	20,240	59	13.07
1974	12,786	70	2,133	5.50	21,851	58	14.63
1975	13,196	68	2,022	5.81	23,780	55	17.27
1976	14,707	69	2,012	6.69	27,122	54	19.40
1977	15,219	68	2,037	6.69	30,460	50	22.01
1978	16,492	68	2,065	7.21	33,385	49	23.97
1979	17,985	69	2,005	8.14	37,185	48	26.77
1980(p)	19,112	68	1,934	8.90	38,740	49	29.61

p - Preliminary

Source: 1963, 1967, 1972, 1977: U.S. Bureau of the Census, "Census of Manufactures," 1977, Industry Series: "Metalworking Machinery and Equipment," MC 77-1-35C and earlier years. Other Years: U .S. Bureau of the Census, "Annual Survey of Manufactures" (Annually).

WEEKLY OVERTIME HOURS OF PRODUCTION WORKERS
Selected Industry Groups, 1957 to Date, Annual Averages

Year	Manufacturing	Durable Goods Industry	Nonelectrical Machinery Machinery Industry	Metalworking Machinery Industry
1957	2.3	2.4	2.8	NA
1958	2.0	1.9	1.8	2.5
1959	2.7	2.7	2.9	4.0
1960	2.4	2.4	2.7	4.3
1961	2.4	2.3	2.5	3.4
1962	2.8	2.8	3.1	4.7
1963	2.8	2.9	3.2	4.8
1964	3.1	3.3	3.9	5.9
1965	3.6	3.9	4.6	6.7
1966	3.9	4.3	5.5	7.8
1967	3.4	3.5	4.4	6.5
1968	3.6	3.8	4.0	5.4
1969	3.6	3.8	4.5	6.0
1970	3.0	2.9	3.2	4.3
1971	2.9	2.9	2.6	2.8
1972	3.5	3.6	3.8	4.9
1973	3.8	4.1	4.7	6.4
1974	3.2	3.4	4.3	5.8
1975	2.6	2.5	3.0	3.3
1976	3.1	3.1	3.1	4.0
1977	3.5	3.7	4.0	5.5
1978	3.6	3.8	4.3	5.9
1979(r)	3.3	3.5	4.0	5.7
1980(r)	2.8	2.8	3.4	4.8
1981	2.8	2.8	3.2	4.1

NA - Not Available. r - Revised.

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings", monthly and annual supplements.

WORK INJURY RATES
By Industry, 1980

	Incidence Rates (per 100 Employees)			
Industry	Total Recordable Cases	Lost Workday Cases	Nonfatal Cases Without Lost Workdays	Average Lost Workdays Per Lost Workday Case
Manufacturing	12.2	5.4	6.8	16.0
Fabricated Metal Products	18.5	8.0	10.5	15.0
Metal Stampings	17.0	7.5	9.4	NA
Machinery Except Electrical	13.7	5.5	8.2	15.0
Engines and Turbines	11.2	4.9	6.3	NA
Construction and Related Machinery	17.3	7.7	9.6	NA
Metalworking Machinery	14.1	4.9	9.2	NA
Machine Tools, Metal Cutting Types	15.1	5.3	9.8	NA
Machine Tools, Metal Forming Types	17.2	6.8	10.4	NA
Special Industry Machinery	16.0	5.9	10.1	NA
General Industrial Machinery	15.5	6.4	9.1	NA
Transportation Equipment	10.6	4.9	5.7	17.0
Motor Vehicles and Equipment	9.9	4.3	5.6	NA

Note: Data represents work-related injuries and illnesses in comparable industries.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

AVERAGE HOURLY EARNINGS AND SUPPLEMENTARY LABOR COST
In the Machine Tool Industry of the United States and Six Foreign Countries

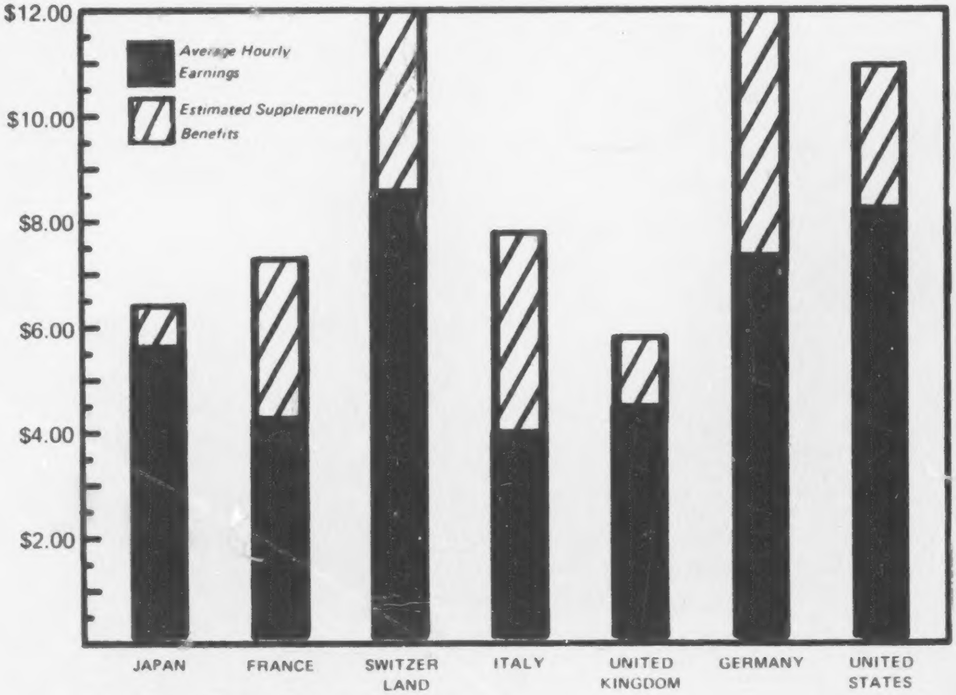
Country	Date	Industry	Workers Covered	Average Hourly Earnings	Estimated Supplementary Labor Cost	Total Compensation
France	1978	(1)	All	$4.24	$ 3.01	$ 7.25
Germany (Federal Republic)	1979	(1)	P.W.	7.32	4.63	11.95
Italy	1979	(1)	P.W.	3.96	3.80	7.76
Switzerland	1980	(2)	P.W.	8.54	3.41	11.95
United Kingdom	1979	(1)	P.W.	4.46	1.30	5.76
Japan	1980	(1)	P.W.	5.57	.83(3)	6.40
United States	1980	(1)	P.W.	8.19	2.70	10.89

P.W. - Production Workers.

(1) Machine Tools.
(2) Metals and Machines.
(3) Non-Electrical Machinery.

Source: U.S. Bureau of Labor Statistics, Branch of International Comparisons. This table differs from the one shown in chapter 2 because it focuses directly on the machine tool industry compensation. The other table shows production woker compensation in manufacturing as a whole.

AVERAGE HOURLY EARNINGS
AND SUPPLEMENTARY BENEFITS*



Source U.S. Department of Labor, Bureau of Labor Statistics
*Figures represent Machine Tool Industry or closest related available industry

AVERAGE HOURLY EARNINGS IN METAL AND METALWORKING INDUSTRIES

In Selected Countries, for Selected Years

Country	Industry	1970	1977	1978	1979	1980	1970-80
United States	(1)	$3.77	$6.26	$6.77	$7.33	$8.04	113%
Japan	(1)	1.11	4.68	6.27	6.59	6.89	521
United Kingdom (a)	(1)	1.52	2.96	3.72	4.81	6.13	329
France	(1)	1.15(2)	3.43	4.12	4.90	NA	NA
Germany	(1)	1.75	5.09	6.16	7.13	7.68	339
Italy	(1)	1.00	2.59	NA	NA	NA	NA
Switzerland (a)	(3)	1.85(b)	5.53	7.64	8.45	8.90	381

(a) Men only.
(b) Skilled men only.
(1) —Machinery, except electrical.
(2) —Machinery.
(3) —Metal products, machinery, etc.

Sources: "ILO 1979 Statistical Yearbook" ("Statistics of average earnings . . . usually cover cash payments received from employers, i.e., remuneration for normal working hours, payments for overtime and time not worked (holidays, vacation, etc.), production bonuses, cost-of-living allowances and special premiums . . .").

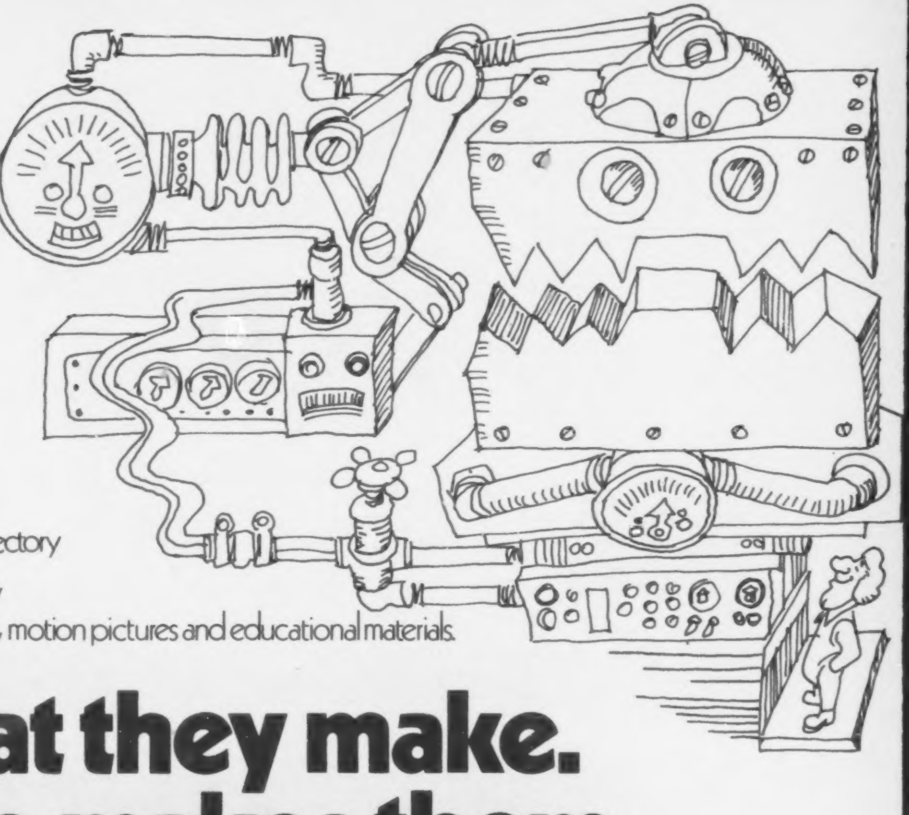
AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS

In Selected Industry Groups, 1980 (a)

Country	All Manufacturing	Machinery, Except Electrical	Electrical Equipment	Motor Vehicles
United States	$10.00	$10.84	$ 9.59	$16.31
Canada	9.04	10.08	8.13	11.52
France	9.23	9.84	9.11	10.26
West Germany	12.26	12.92	11.78	15.20
Italy	8.26	8.74	8.26	8.55
Japan	5.61	6.55	5.15	6.89
Sweden	12.51	12.25	11.91	12.70
United Kingdom	7.37	7.54	7.15	8.02

(a) Preliminary estimates.

Source: U.S. Department of Labor, Bureau of Labor Statistics.



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8

FINANCE

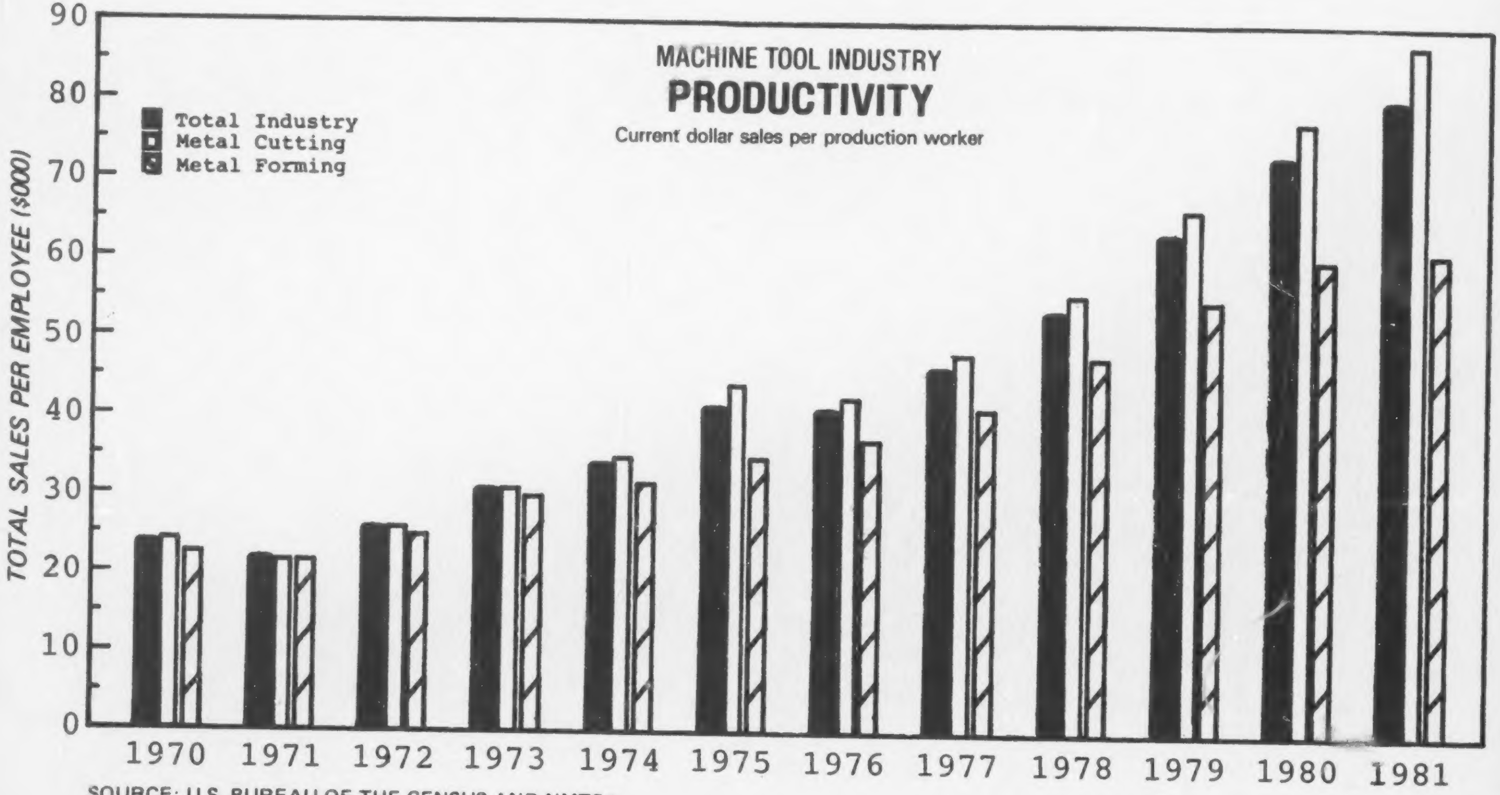
Publicly available data on the financial status of the machine tool industry is scarce. A few sources are the annual reports of the publicly owned machine tool companies and of other companies that produce machine tools. Government statistics on the capital expenditures for "structures and additions" and for "machinery and equipment" in the metal cutting and metal forming machine tool industries are an indirect measure of financial health.

Selected financial indicators for a machine tool composite from the "Industry Surveys" of Standard and Poor's Corporation are included in this chapter. The machine tool composite combines data for six relatively large machine tool companies on the basis of the total market value of equity stock outstanding.

Each indicator from "Industry Surveys" is an index based on average value per share of outstanding stock. We have converted these indicators from the original base of 1941—1943 = 10 to 1967 = 100 to conform with other indexes in this publication. The financial indicators for the composite do not necessarily represent an average for the entire machine tool industry, but given the scarcity of financial information, are a valuable addition to this chapter.

Data collected by an outside research group for the National Machine Tool Builders' Association indicate that the rate of profit of machine tool manufacturers tends to be somewhat higher than that of all manufacturing industries during good times, but drastically worse in less prosperous periods.

It should be emphasized that all the data in this section are in current dollars and that in periods of rapid inflation the true state of earnings and capital accumulation is seriously distorted. In particular, overstatement of "inventory profits" and the understatement—relative to replacement costs—of depreciation charges on capital equipment.



MACHINE TOOL INDUSTRY

PRODUCTIVITY

Current dollar sales per production worker

SOURCE: U.S. BUREAU OF THE CENSUS AND NMTBA

SELECTED FINANCIAL RATIOS FOR CORPORATIONS IN SELECTED INDUSTRIES, 1981

Industry	% Net Operating Profit on Sales	% Earnings on Sales AfterTaxes	% Earnings On Net Worth AfterTaxes	% Depreciation and Amortization on Net Sales	Times Inventory Turnover	Times Current Assets to Current Liabilities
Machine Tools	12.6	7.1	18.0	1.5	3.6	2.5
All Manufacturing Corporations	6.8	4.7	13.8	3.1	6.7	1.6
Durable Manufactures	6.5	4.2	12.0	3.3	5.2	1.7
Electrical Machinery	7.3	5.0	14.6	2.8	4.7	1.6
Machinery, Except Electrical	9.9	6.4	14.8	3.8	4.6	1.7
Motor Vehicles	0.3	(0.2)	(0.6)	5.0	9.0	1.2
Chemical and Allied Products	8.5	6.8	15.1	3.8	6.5	1.9

( ) - negative

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" and NMTBA.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Machine Tool Industry, 1962 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structure and Additions	Machinery and Equipment	Total	Structure and Additions	Machinery and Equipment
1962	$ 722	$ 519	NA	NA	$203	NA	NA
1963	743	531	NA	NA	212	NA	NA
1964	800	558	NA	NA	242	NA	NA
1965	NA	NA	NA	NA	NA	NA	NA
1966	NA	NA	NA	NA	NA	NA	NA
1967	1,099	800	$245	$ 555	299	$ 88	$211
1968	1,161	845	253	592	316	94	222
1969	1,224	889	269	620	335	98	237
1970	1,235	884	270	614	351	109	242
1971	1,241	874	272	602	367	114	253
1972	1,228	841	263	578	387	120	267
1973	1,251	851	259	592	400	121	279
1974	1,324	895	260	635	429	131	298
1975	1,356	937	266	671	419	125	294
1976	1,412	1,000	279	721	412	127	285
1977(r)	1,478	1,035	295	740	443	129	314
1978(r)	1,603	1,115	330	785	488	138	350
1979	1,899	1,333	372	961	566	160	406
1980	2,065	1,453	417	1,036	612	168	444

NA - Not Available. r - Revised.

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures".

NEW CAPITAL EXPENDITURES IN THE MACHINE TOOL INDUSTRY

1954 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structure and Additions	Machinery and Equipment	Total	Structure and Additions	Machinery and Equipment
1954	NA	$ 37.7	$ 11.2	$ 26.5	NA	NA	NA
1955	NA	44.0	NA	NA	NA	NA	NA
1956	NA	49.2	NA	NA	NA	NA	NA
1957	NA	39.7	NA	NA	NA	NA	NA
1958	$ 30.5	18.8	1.9	16.9	$11.7	$ 3.8	$ 7.9
1959	31.9	22.2	NA	NA	9.7	NA	NA
1960	37.4	24.8	NA	NA	12.6	NA	NA
1961	26.4	18.7	NA	NA	7.7	NA	NA
1962	39.3	26.6	NA	NA	12.7(a)	NA	NA
1963	39.6	28.8	5.4	23.4	10.8	2.1	8.7
1964	71.7	41.7	11.0	30.7	30.0(a)	7.5(a)	22.5(a)
1965	74.2	53.7	10.2	43.5	20.5	4.4(a)	16.1
1966	102.5	74.9	17.1	57.8	27.6	6.2(a)	21.4(a)
1967	104.9	78.7	19.3	59.3	26.2	5.7	20.5
1968	90.9	62.3	9.1	53.2	28.6	7.7	20.9
1969	105.0	75.5	21.8	53.7	29.5	7.7	21.8
1970	72.7	49.3	11.7	37.6	23.4	7.8	15.6
1971	39.1	28.7	4.6	24.1	10.4	1.6	8.9
1972	52.7	35.2	7.2	28.0	17.5	4.7	12.8
1973	65.9	38.4	7.3	31.1	27.5	4.0	23.4
1974	93.3	58.9	10.6	48.3	34.4	8.6	25.9
1975	76.1	52.2	7.9	44.2	23.9	4.0	19.9
1976	93.5	65.2	11.2	54.0	28.3	10.8	17.5
1977	132.4	107.9	19.1	88.8	24.5	2.6	21.9
1978	142.4	102.0	22.4	79.6	40.4	5.8	34.6
1979	199.4	147.6	31.8	115.8	51.8	9.7	42.1
1980	241.0	171.6	39.8	131.8	69.4	14.5	54.9

NA - Not Available.

(a) Standard errors exceeding 15%, not consistent with other Census data in metal forming.

Note: Change of definition of machine tool industry makes comparisons before 1957 difficult.

Source: U.S. Bureau of the Census, "Census of Manufactures", 1963, 1967, 1972, 1977; U.S. Bureau of the Census, "Annual Survey of Manufactures".

MACHINE TOOL FINANCIAL INDICATORS (a)

Per Share Data

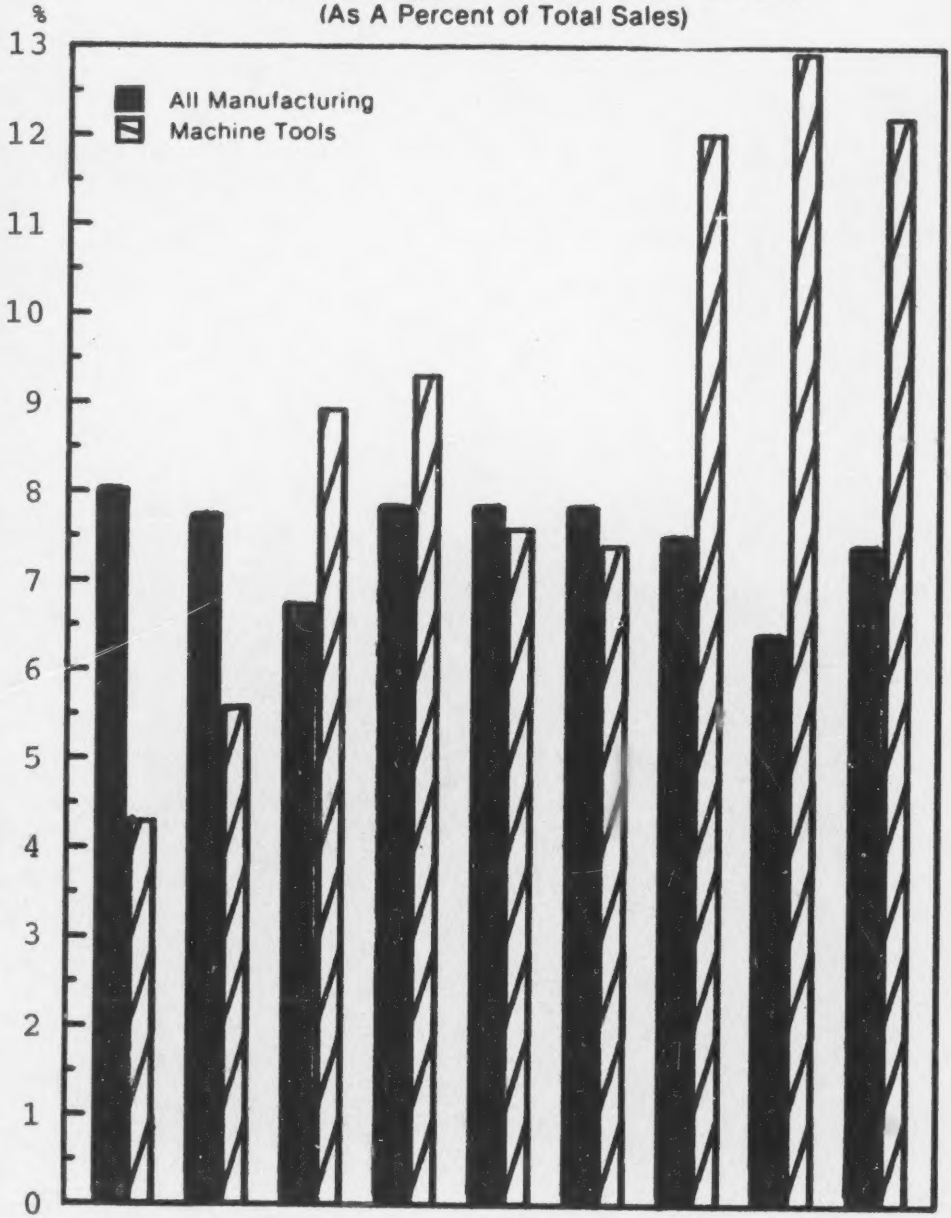
(1967 = 100)

Year	Sales	Operating Profit	Depreciation	Book Value	Working Capital	Capital Expenditures
1956	73.4	66.0	45.8	75.3	67.1	90.7
1957	67.9	53.3	50.9	78.8	71.0	67.2
1958	42.6	14.9	52.4	77.4	70.3	51.4
1959	46.3	15.7	53.8	75.5	68.0	42.5
1960	54.8	26.5	56.6	75.6	65.8	61.1
1961	54.1	29.3	56.1	76.4	67.6	45.3
1962	59.6	28.4	50.9	77.8	70.1	44.9
1963	61.7	37.2	58.0	80.0	72.2	61.9
1964	64.9	57.1	66.0	74.5	66.1	95.1
1965	77.2	70.1	73.6	81.6	82.2	103.2
1966	92.9	88.7	84.4	90.2	92.1	142.5
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	99.0	100.3	117.5	106.9	101.7	167.6
1969	100.7	87.6	118.9	110.2	103.6	156.7
1970	89.7	42.4	120.8	110.1	107.7	122.3
1971	73.4	16.2	112.7	108.0	101.9	93.9
1972	88.4	32.2	111.8	106.2	104.7	150.6
1973	119.4	73.1	116.0	111.8	107.4	217.8
1974	145.0	81.4	124.5	116.5	153.2	247.8
1975	156.6	82.7	136.8	120.5	159.6	176.5
1976	146.9	79.0	142.5	124.8	154.1	156.3
1977	167.2	114.5	151.9	132.5	158.1	208.9
1978	197.7	165.5	157.1	149.2	169.9	248.2
1979	237.5	234.4	177.8	177.8	190.0	371.7
1980	250.6	277.9	218.4	226.8	263.4	542.6

(a) Data in this table represent a composite of financial information for six publicly held machine tool companies. Companies included in the group have changed through time, but not since April 1968.

Source: Standard & Poor's Corporation, Data in original form, 1941-43 equals 10, taken from "Industry Surveys", a copyright of Standard & Poor's Corporation. "Industry Surveys" has a wide variety of additional information for the machine tool composite and individual companies.

NET INCOME BEFORE TAXES
All Manufacturing and Machine Tools, 1973-1981
(As A Percent of Total Sales)



AVERAGE NET INCOME OF ALL MANUFACTURING CORPORATIONS AND MACHINE TOOL COMPANIES SURVEYED

1967 to Date

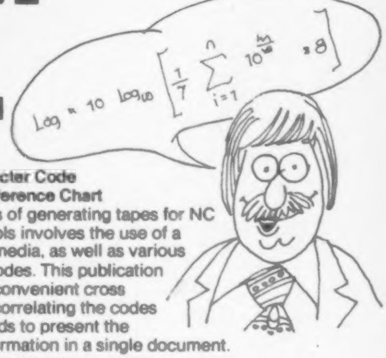
Year	NET INCOME BEFORE TAXES			
	As Percent of Sales		As Percent of Assets	
	All Manufacturers	Machine Tool Manufacturers (a)	All Manufacturers	Machine Tool Manufacturers (a)
1967	8.3%	12.1%	10.9%	16.6%
1968	8.8	11.6	11.7	15.1
1969	8.4	8.9	10.7	10.6
1970	6.8	3.8	8.3	4.8
1971	7.0	(2.7)	8.7	(2.7)
1972	7.4	(1.3)	9.5	(1.4)
1973	8.0	4.3	11.0	4.8
1974	7.7	5.6	10.7	7.2
1975	6.7	8.9	8.8	12.7
1976	7.8	9.3	10.6	12.3
1977	7.8	7.6	13.5	12.8
1978	7.8	7.4	10.7	11.8
1979	7.5	12.0	11.1	16.9
1980	6.4	12.9	8.7	19.4
1981	7.4	12.2	10.2	18.0

(a) Data based on the machine tool activities of about 100 companies.

Note: Figures in parentheses represent negative figures.

Sources: National Machine Tool Builders' Association, Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

TECHNICALLY SPEAKING...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9

MACHINE TOOLS IN USE

American Machinist magazine has been conducting surveys of metalworking equipment in use by American industry for over 50 years—a total of 12 complete Inventories. Through the years the impact of advancing technology, shifting industrial classifications and improved statistical techniques have brought about changes in procedures for compilation and publication of inventory data.

Through 1973, the Inventory was conducted every five years covering all the metalworking industries. The 12th Inventory was conducted over a period of three years with approximately one-third of metalworking surveyed each year from 1976 to 1978. As the 12th Inventory was completed in 1978, all of the data in this chapter is taken from this latest compilation. While the data presented are believed to accurately reflect the machine tools in use in the United States, the user should be aware of two differences between the 12th Inventory and those of earlier years.

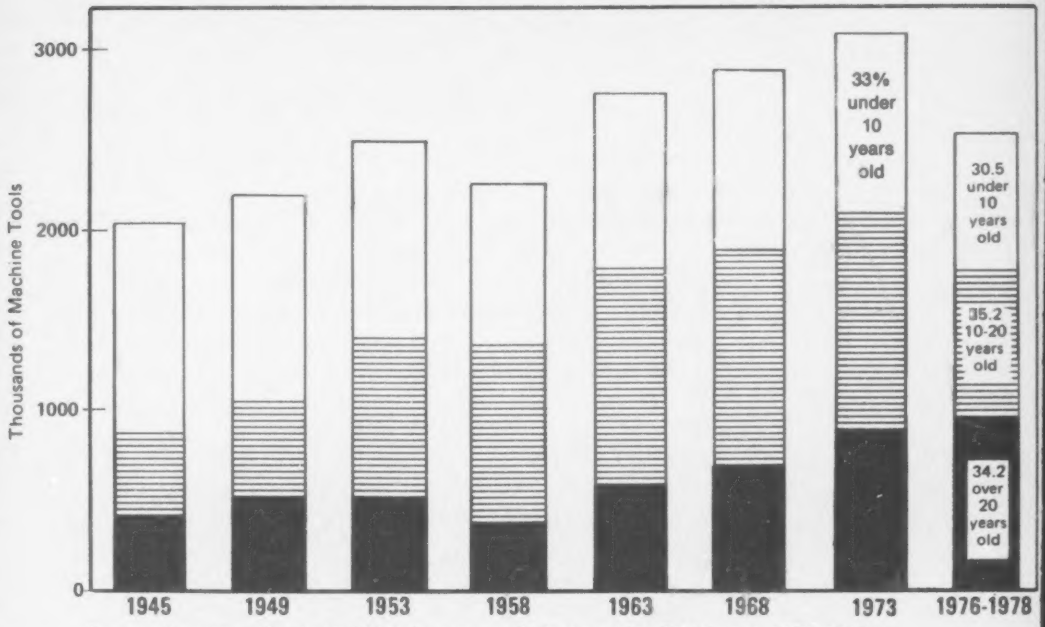
Since the data were collected and published over a three-year period, the inventory taken in one year may not be directly comparable with that of another. Also, earlier inventories included metalworking establishments of all sizes whereas the 12th Inventory emphasized plants with 20 or more employees. American Machinist has prepared estimates of the number of machines in plants with less than 20 employees. The tables in this chapter which include these estimates are so noted.

Also included is the chart of Inventory data showing the number of machine tools in seven industrial nations and their average age distribution. This chart brings to light the fact that while the U.S. has a very large stock of machine tools it is also a relatively old, somewhat obsolescent stock.

The American Machinist Inventory is based on a sample survey. It is in the nature of such a survey that the reliability of the data is greatest in the broader categories. It decreases as survey results are broken down into smaller and smaller cells. A broad breakdown, such as "grinding machine tools in the North Central States," will therefore tend to be more reliable than a very detailed breakdown such as "circular saws, over 20 years old, in New Mexico and Texas."

Additional information concerning the American Machinist Inventory may be obtained from Manufacturing Research Institute of American Machinist, 1221 Avenue of the Americas, New York, New York 10020.

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES



Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

TOTAL MACHINE TOOLS IN THE UNITED STATES
Estimated Number, 1978

Use or Location	Total	Metal Cutting	Metal Forming
TOTAL	3,365,700	2,541,500	824,200
Metalworking Industries (a)	2,630,700	1,986,500	644,200
Other Industries	450,000	315,000	135,000
Training	85,000	80,000	5,000
In Storage and Surplus	200,000	160,000	40,000

(a) As used here, metalworking industries are: furniture industry (SIC 25), primary metals industry (SIC 33), fabricated metal products industry (SIC 34), non-electrical machinery industry (SIC 35), electrical machinery industry (SIC 36), transportation equipment industry (SIC 37), precision instruments industry (SIC 38), and miscellaneous manufacturing industry (SIC 39).

Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978".

MACHINE TOOLS IN USE

Metalworking Industries, 1963 to 1976-1978 (a)

(Number in Thousands and Percent of Total)

		By Age						With Numerical Control	
		Under 10 Years		10-20 Years		Over 20 Years			
Year-Industry	Total	Number	%	Number	%	Number	%	Number	%
1963									
All Metalworking	2,808.5	1,011.1	36.0	1,215.6	43.3	581.8	20.7	NA	NA
Non-Electrical Machy.	951.9	315.0	33.1	424.0	44.5	212.9	22.4	NA	NA
Metalworking Machy.	210.6	77.9	37.0	90.3	42.9	42.4	20.1	NA	NA
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1968									
All Metalworking	2,869.8	1,021.4	35.6	1,176.2	41.0	672.2	23.4	14.2	0.5
Non-Electrical Machy.	912.5	325.3	35.6	350.4	38.4	236.9	26.0	6.8	0.7
Metalworking Machy.	248.7	97.1	39.0	93.9	37.8	57.7	23.2	1.8	0.7
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1973									
All Metalworking	3,065.5	1,009.8	32.9	1,185.1	38.7	870.6	28.4	28.6	0.9
Non-Electrical Machy.	1,103.6	379.8	34.4	410.9	37.2	312.9	28.4	15.1	1.4
Metalworking Machy.	274.5	105.5	38.4	102.3	37.3	66.6	24.3	3.3	1.2
Machine Tools	57.1	17.2	20.1	20.0	35.0	19.9	34.9	1.5	2.6
1976-1978 (b)									
All Metalworking	2,630.7	802.5	30.5	927.2	35.2	900.9	34.2	52.9	2.0
Non-Electrical Machy.	961.0	314.8	32.8	337.5	35.1	308.7	32.1	29.7	3.1
Metalworking Machy.	242.1	82.1	33.9	87.8	36.3	72.2	29.8	6.9(c)	3.1(c)
Machine Tools	69.5	16.0	23.0	25.6	36.8	27.8	40.0	2.6	3.7

NA - Not Available.

(a) Includes estimates of machines in plants with less than 20 employees.
(b) Machines 20 years old are included in the "Over 20 Years" category.
(c) Metal cutting industries only.

Source: American Machinist Metalworking Equipment Inventories.

MACHINE TOOLS IN USE IN SEVEN INDUSTRIAL NATIONS

By Number and Age

(Number in Thousands)

			Percent of Total		
Country	Year	Total	Under 10 Years	10-20 Years	Over 20 Years
United States	1976-78	2,631	31%	35%	34%
West Germany (c)	1977	1,480	37	37	26
United Kingdom	1976	891	39	37	24
Japan	1973	825(a)	61	21	18
France (d)	1974	742	37	33	30
Italy (e)	1975	541(b)	42	30	28
Canada	1978	211	47	35	18

(a) American Machinist, March 1977, indicates this total is for plants with over 100 employees only and the number of plants with less than 100 employees is large. In October 1973 American Machinist estimated the Japanese machine tool park at 1.5 million units.
(b) This total applies only to plants in the metalworking industries with 20 or more employees. The total number of machine tools in plants of all sizes in all industries is estimated to be about 840 thousand.
(c) Machine tool age classifications are as follows: Under 11 Years, 11 to 20 Years, Over 20 Years.
(d) Machine tool age classifications are as follows: Under 9 Years, 9 to 19 Years, Over 19 Years.
(e) Machine tool age classifications are as follows: Under 9 Years, 9-17 Years, Over 17 Years.

Source: McGraw Hill, Inc. "American Machinist" and Verein Deutscher Werkzeugmaschinenfabrik e.V.

MACHINE TOOLS IN USE
Metalworking Industries (a), 1976-1978
(Number in Thousands and Percent of Total)

		By Age						With Numerical Control	
		Under 10 Years		10-19 Years		20 Years and Over			
Year-Industry	Total	Number	%	Number	%	Number	%	Number	%
TOTAL	2,630.7	802.6	30.5	927.2	35.2	900.9	34.2	52.9	2.0
Metal Furniture, Fixtures	36.8	12.4	33.7	12.7	34.5	11.8	32.1	NA	NA
Primary Metals	117.3	34.2	29.1	38.2	32.6	44.9	38.3	0.8	0.6
Fabricated Metal Products	631.6	172.9	27.4	222.5	35.2	236.3	37.4	5.6	0.9
Fab. Structural Metal Products	162.5	50.5	31.1	64.1	39.4	47.9	29.5	2.0	1.2
Screw Machine Products	94.3	26.7	28.3	33.4	35.4	33.0	35.0	NA	NA
Metal Stampings	113.8	29.7	26.1	38.2	33.6	45.9	40.3	0.4	0.3
Other Fab. Metal Products	261.0	66.1	25.3	86.2	33.0	109.5	42.0	NA	NA
Non-electrical Machinery	961.0	314.8	32.8	337.5	35.1	308.7	32.1	29.7	3.1
Metalworking Machinery	242.1	82.1	33.9	87.8	36.3	72.2	29.8	NA	NA
Machine Tools	69.5	16.0	23.0	25.6	36.8	27.8	40.0	2.6	3.7
Special Industry Machy.	97.6	27.3	28.0	33.5	34.3	36.8	37.7	4.2	4.3
General Industrial Machy.	133.5	50.7	38.0	52.1	39.0	44.1	33.0	3.1	2.3
Other Non-elec. Machy.	487.8	154.6	31.7	164.2	33.7	155.6	31.9	NA	NA
Electrical Machinery	339.1	111.9	33.0	141.3	41.7	85.9	25.3	4.7	1.4
Elec. Industrial Apparatus	67.3	20.9	32.8	24.8	38.9	18.0	28.3	1.2	1.9
Communications Equip.	62.8	18.3	29.1	34.2	54.5	10.4	16.6	1.4	2.2
Other Elec. Machy.	212.6	72.7	34.2	82.3	38.7	57.5	27.0	2.1	1.0
Transportation Equip.	361.1	86.0	23.8	119.2	33.0	155.9	43.2	9.1	2.5
Motor Vehicles, Equip.	177.9	42.3	23.8	55.9	31.4	79.7	44.8	1.0	0.6
Aircraft and Parts	139.1	32.6	23.4	94.2	67.7	57.9	41.6	7.4	5.3
Others Trans. Equip.	44.1	11.1	25.2	14.7	33.3	18.3	41.5	0.7	1.6
Precision Instruments	132.5	50.4	38.0	48.8	36.8	33.3	25.1	2.5	1.9
Misc. Mfg. Industries	51.3	19.8	38.6	17.2	33.5	14.4	28.1	0.4	0.8

NA - Not Available.

Note: Individual items may not add to totals due to rounding.

(a) Includes estimates of machines in plants with less than 20 employees.

Source: American Machinist, "The 12th American Machinist Inventory of Metalworking Equipment, 1976-1978."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES
By Major User Industry, 1973
(Number in Thousands)

	Total Machine Tools		Metal Cutting Machines		Metal Forming Machines	
Using Industry	Number	%	Number	% Under 10 Yrs. Old	Number	% Under 10 Yrs. Old
TOTAL	3,065.5	100.0%	2,362.2	34%	703.3	31%
Ordnance & Accessories	42.7	1.4%	35.2	28%	7.5	28%
Furniture & Fixtures	43.7	1.4	18.2	32	25.4	29
Primary Metals Industries	162.9	5.3	129.7	26	33.2	27
Fabricated Metal Products	638.4	20.8	394.0	33	244.4	28
Non-electrical Machinery	1,103.6	36.0	968.3	35	135.3	30
Electrical Machy. & Equipment	398.7	13.0	280.2	40	118.5	38
Transportation Equipment	400.9	13.1	328.1	30	72.8	32
Precision Instruments	164.3	5.4	140.7	29	23.5	35
Miscellaneous Mfg. Industries	110.4	3.6	67.8	33	42.6	23

Source: American Machinist, "11th Inventory of Metalworking Equipment, 1973."

GEOGRAPHICAL DISTRIBUTION OF MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES, 1976-1978 (a)

(By Number and Age Distribution)

	Metal Cutting Machines					Metal Forming Machines					No. Units with NC		% Plants with NC			
Region and Area	Total Units	0-4 Years	5-9 Years	10-19 Years	20 Years & Over	Total Units	0-4 Years	5-9 Years	10-19 Years	20 Years & Over	Cutting	Forming	Cutting	Turning	Mach. ctrs.	Forming
U.S.A.	1,738,282	10%	21%	35%	34%	581,441	9%	20%	36%	35%	40,019	2,003	24%	12%	16%	4%
NORTHEAST																
Boston	103,678	10%	22%	35%	33%	32,416	9%	21%	37%	33%	2,529	117	29%	13%	20%	4%
Bridgeport-Hartford	74,812	9	18	35	38	23,420	9	20	36	35	1,909	46	25	10	15	2
New York-Newark	126,112	11	23	37	29	44,627	10	21	38	31	2,657	174	20	8	13	2
Buffalo-Syracuse	64,642	11	21	34	34	18,896	10	19	36	35	1,410	72	30	14	24	5
Philadelphia-Camden	85,897	10	21	35	34	32,918	9	20	38	33	1,799	102	22	9	15	3
Pittsburgh-Wheeling	53,970	9	21	35	35	20,198	9	21	35	35	1,141	84	28	17	16	3
SOUTHEAST																
Baltimore	16,442	9	21	38	32	5,491	8	19	42	31	359	21	28	8	19	7
Richmond	46,587	9	21	36	34	17,388	8	21	37	34	899	58	29	12	22	5
Atlanta-New Orleans	83,183	10	21	36	33	35,206	9	20	37	34	1,734	117	16	7	11	4
MIDWEST																
Cleveland	84,332	10	21	35	34	31,293	9	18	36	37	1,776	85	26	15	17	5
Toledo	22,748	10	19	36	35	8,042	9	17	36	38	369	14	30	15	23	5
Cincinnati-Louisville	70,917	9	20	36	35	23,477	9	18	36	37	1,668	61	27	16	20	3
Detroit	118,601	10	20	33	37	35,919	9	17	33	41	1,740	56	25	9	15	2
Indianapolis	70,239	10	18	32	40	18,903	9	18	35	38	1,287	45	23	10	13	2
Chicago	245,090	12	21	35	32	89,470	10	20	36	34	5,546	373	22	12	14	5
Milwaukee	63,831	11	20	33	36	20,092	10	19	35	36	1,426	76	25	12	17	5
Minneapolis-St. Paul	33,240	10	22	35	33	10,151	10	19	35	36	820	42	27	10	17	5
St. Louis	62,530	10	20	36	34	21,276	9	19	37	35	1,591	72	11	8	7	4
SOUTHWEST																
Kansas City - Tulsa	36,287	10	19	35	36	11,243	9	18	37	36	1,029	45	24	13	18	5
Dallas-Houston	57,722	11	20	35	34	16,870	9	19	36	36	1,835	71	26	17	17	4
MOUNTAIN AND PACIFIC																
Denver	25,573	11	21	36	32	8,276	9	19	39	33	564	28	24	13	18	5
Seattle-Portland	21,061	9	20	35	36	6,002	7	17	35	41	633	22	22	10	14	4
San Francisco,	29,778	10	23	39	28	10,350	8	21	38	33	626	48	20	9	14	6
Los Angeles	141,010	11	23	37	29	39,517	9	21	38	32	4,672	174	26	12	4	2

(a) Includes only plants with 20 or more employees.

Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES
By Major Type and Age, 1976-1978

Type of Machine Tool	Plants With	Total Units (a)	Change Since '73	Percent of Total	0-4 Years	5-9 Years	10-19 Years	20 Years and Over
GRAND TOTAL	—	2,630,700	−14%	100.0%	10%	21%	35%	34%
Turning Machines	84%	423,900	−14	16.1	9	18	34	39
Grinding Machines	82	402,900	−18	15.3	10	21	35	34
Drilling Machines	87	373,100	−18	14.2	9	20	37	33
Mechanical Presses	45	251,300	−14	9.6	6	15	36	43
Milling Machines	78	251,200	−13	9.5	10	22	37	31
Cutoff and Sawing	86	169,900	−22	6.4	13	25	38	23
Bending and Forming	45	83,700	−15	3.2	10	22	38	30
Polishing and Buffing	40	74,600	−32	2.8	9	25	37	29
Punching and Shearing	43	65,800	−26	2.5	11	22	35	33
Hydraulic, Pneumatic Presses	36	64,300	−16	2.4	14	25	36	25
Boring Machines	32	54,100	−26	2.1	8	16	34	45
Coil Handling	16	53,400	—	2.0	13	28	40	19
Riveting Hachines	21	46,400	−16	1.8	12	26	40	22
Gear-Cutting Machines	11	42,100	+2	1.6	7	11	34	48
Tapping Machines	26	31,100	−14	1.2	14	25	35	26
Forging Machines	8	22,700	−18	0.9	8	14	30	48
Shaping Machines	31	22,200	−22	0.8	2	5	28	65
Honing Machines	26	21,000	+1	0.8	13	26	36	25
Multi-Function Machines	17	20,200	+37	0.8	38	39	21	2
Automatic Assembly	7	19,300	+12	0.7	24	33	31	11
Spcl. Way-Type & Transfer	5	18,700	+26	0.7	21	27	33	19
Broaching Machines	18	14,500	−1	0.6	8	10	33	43
Threading Machines	16	13,200	−16	0.5	10	15	36	40
Electrical Machining	15	12,000	+7	0.5	26	35	33	6
Lapping Machines	11	10,000	−20	0.4	12	28	30	30
Planing Machines	11	6,700	−12	0.3	2	5	22	71

(a) Includes estimates of machines in plants with less than 20 employees.

Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

NUMERICALLY CONTROLLED MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES (a)

Number by Type of Machine and User Industry, 1976-1978

	Metal Cutting						Metal Forming Total
Using Industry	Total	Turn	Bore	Drill	Mill	Multi-Function	
TOTAL	40,019	9,378	2,894	3,216	4,498	18,328	2,003
Metal Furniture and Fixtures	Z	Z	Z	Z	Z	Z	81
Primary Metals Industries	680	209	73	23	89	260	11
Fabricated Metal Products	4,086	1,098	370	304	343	1,767	590
Ordnance and Accessories	702	164	71	14	26	408	14
Non-electrical Machinery	20,348	5,308	1,601	1,734	1,046	10,263	491
Metalworking Machinery	4,830	889	556	319	282	2,590	13
Special Industry Machinery	2,634	471	218	338	160	1,445	35
Electrical Machinery and Equipment	4,229	744	137	571	408	2,055	420
Transportation Equipment	8,023	1,588	676	487	2,342	2,702	158
Aircraft Engines and Parts	6,695	1,237	557	351	2,207	2,207	60
Precision Instruments	2,070	397	33	92	228	1,218	244
Miscellaneous Manufacturing Industries	189	34	Z	Z	41	57	Z

(a) Includes only plants with 20 or more employees.

Z - Less than 10 units.

Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

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Abbreviations

and

Explanation of Terms

ABBREVIATIONS

ADR — The Asset Depreciation Range System
BEA — Bureau of Economic Analysis
BLS — Bureau of Labor Statistics
BTN — Brussels Tariff Nomenclature
CCC — Customs Co-Operation Council
CECIMO — Comité Européen de Coopération des Industries de la Machine Outil
C.I.F. — Cost, Insurance and Freight. Under these terms, the seller quotes a price which includes the cost of the goods, marine insurance and the transportation charges to a specified point of destination.
D — Withheld to avoid disclosing figures for individual companies
E — Estimate
EEC — European Economic Community
F.A.S. — Free Alongside Ship. Prices specified under these export terms provide that the seller delivers the goods to be exported alongside the overseas vessel within reach of its loading equipment.
F.O.B. — Free on Board. Seller is required to place goods aboard the equipment of the transporting carrier without cost to the buyer. The term F.O.B. must be qualified by a name destination.
FTC — Federal Trade Commission
GNP — Gross National Product
ILO — International Labor Organization
ITC — International Trade Commission
NA — Not Available
NC — Numerically Controlled
NEC — Not Elsewhere Classified
NMTBA — National Machine Tool Builders' Association
P — Preliminary
R — Revised
S — Estimate did not meet Publication Standards
SEC — Securities and Exchange Commission
S.I.C. — Standard Industrial Classification
SITC — Standard International Trade Classification of the United Nations
TSUSA — Tariff Schedules of the U.S., Annotated
U.N. — United Nations
VDMA — Verein Deutscher Maschinenbauanstalten
VDW — Fachgemeinschaft Werkzeugmaschinen in VDMA
Z — Figure below the Minimum Unit of Measure Selected

EXPLANATION OF TERMS

ACCESSIONS
........See LABOR TURNOVER

AIRCRAFT, MISSILES AND PARTS
........Industry Group, conforming to the Standard Industrial Classification. Consists of Industry Group, SIC 372, Aircraft and Parts, and SIC 376, Establishments Primarily Engaged in Manufacturing Complete Guided Missiles and Space Vehicles and Parts.

ASSETS, NET
........Total net assets are the sum of all recorded assets after reducing such amount by allowance or reserve for bad debts, depreciation and amortization, but before deducting any liabilities, mortgages or other indebtedness.

AVERAGE HOURLY EARNINGS
........See EARNINGS

AVERAGE STRAIGHT-TIME HOURLY EARNINGS
........See EARNINGS

AVERAGE WEEKLY HOURS
........See HOURS, AVERAGE WEEKLY

AVERAGE WEEKLY EARNINGS
........See EARNINGS

BACKLOG
........See ORDERS, UNFILLED

CANCELLATIONS
........Gross new orders less cancellations equal net new orders in the order data of NMTBA. Cancellation provisions are usually specified in purchase orders.

CAPACITY UTILIZATION
........There are seven different series on capacity utilization. The most widely used are the indexes published by the Federal Reserve Board, the U.S. Department of Commerce's Bureau of Economic Analysis and McGraw-Hill Publications. Though their statistical methodology varies, each of these indexes attempts to present a measure of current physical industrial output levels as they compare to the potential level of output if all available productive facilities were in full use. Some series measure utilization according to absolute output potential while others measure utilization relative to that portion of absolute capacity which management prefers. While these differences lead to divergent index numbers, quite often the relative changes of the different indexes parallel each other.

CAPITAL EXPENDITURES
........See PLANT AND EQUIPMENT

CAPITAL GOOD INDUSTRIES
........This category is defined as the Nonelectrical Machinery industry, exclusive of farm machinery and equipment producers and machinery shops, the Electrical Machinery Industry, exclusive of household appliances and electronic components manufacturers, and the non-defense portion of the following industries: Shipbuilding and Repairing, Railroad Equipment, Communication Equipment, Aircraft and Parts, and Ordnance plus Defense Products.

COMPENSATION
........See EARNINGS; PAYROLL

COMPENSATION, SUPPLEMENTARY
........Supplementary compensation statistics fall into two broad categories and are intended to capture

payroll expenditures made by employers which are in addition to the stated hourly wage rate. These categories are:

1. Payments to Workers—which includes payments for paid leave time, premiums for overtime, weekend, holiday, and shift work; non-production bonuses (e.g., Christmas); and terminal payments.
2. Expenditures in Addition to Payroll—which encompass expenditures for which the employer irrevocably makes a payment under the provisions of a legally required insurance program or private welfare plan; e.g., social security, unemployment compensation and other insurance for the benefit of the workers; life, accident, and health insurance; pension and retirement plans; vacation and holiday funds; severance and supplemental unemployment benefit plans; and savings and thrift plans.

For further explanation, see the "BLS Handbook of Methods, U.S. Bureau of Labor Statistics, Bulletin 1910."

CONSTANT DOLLARS

........Constant dollar estimates represent an effort to remove the effects of price changes from statistical series. In general, they are arrived at by dividing current dollar estimates by appropriate price indexes.

Any changes in such a series would reflect only changes in the "real" (physical) volume of output.

........See IMPLICIT PRICE DEFLATOR.

CONSUMER PRICE INDEX

........See PRICE INDEX

CONSUMPTION

........The term consumption, as used in this publication, refers to the domestic production, less exports, plus imports of a particular commodity.

CONTROLS

........See NUMERICAL CONTROLS

CORPORATE CAPITAL CONSUMPTION ALLOWANCES

........Accounting charges which reflect estimates of wear and tear, obsolescence, destruction, and accidental losses of physical capital.

Gross National Product less capital consumption allowances is referred to as Net National Product.

COST OF MATERIALS

........See MATERIALS, COST OF

DEFENSE PRODUCTS

........The "defense products" category for manufacturers' shipments, orders, and inventories consists of communication equipment, complete aircraft and parts, shipbuilding and military tank vehicles and ordnance. See Census Bureau, Current Industrial Report, Series: M3-1 and MA-175 Shipments of Defense-oriented Industries.

DEPRECIATION

........Depreciation is the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are numerous depreciation methods, all based on a periodic charge to an expense account and a corresponding credit to a depreciation reserve.

Plant (Structure and Additions) depreciation and amortization are usually reported separately from machinery and equipment depreciation.

DIFFERENTIAL (SHIFT)

........Shift differentials represent premium payments for work on late or night shifts. They are part of Supplementary Compensation (See COMPENSATION, SUPPLEMENTARY) paid to workers.

DOMESTIC (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........Totals are the sum of "domestic" and "foreign." "Domestic" represents business activity originating within or destined for the United States, its territories and possessions.

DURABLE GOODS

........An item, destined for either producers or consumers, that in normal use is likely to last longer than three years. Consumer durable goods include automobiles, appliances, jewelry and books. Producer durable goods include a wide range of machinery and equipment.

DURABLE GOODS INDUSTRIES

........Comprise manufacturing major industry groups with SIC Codes 19, 24, 25, and 32 through 39. All other manufacturing major industry groups in SIC Codes 20 through 39 are considered as nondurable goods manufacturing industry groups.

EARNINGS

........Earnings are the actual return to the worker for a stated period of time. Irregular bonuses, retroactive items, payments of various welfare benefits, payroll taxes paid by employers are excluded.

........AVERAGE HOURLY EARNINGS

........are on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as premium pay for overtime and late shift work, and changes in output of workers paid on an incentive plan.

........AVERAGE STRAIGHT-TIME HOURLY EARNINGS

........exclude premium payments for overtime and for work on weekends, holidays, and late shifts. Regular day-shift wages or salaries paid per hour worked during a standard workweek are included; incentive pay, production bonuses, and cost of living payments are included in these statistics. Non-production bonuses are excluded.

........AVERAGE WEEKLY EARNINGS

........are derived by multiplying average weekly hours by hourly earnings.

ELECTRICAL MACHINERY INDUSTRY

........Major Group 36, Electrical Machinery, Equipment and Supplies, according to the Standard Industrial Classification, comprises SIC Industry Groups:

........361. Electrical Transmission and Distribution Equipment
362. Electrical Industrial Apparatus
363. Household Appliances
364. Electrical Lighting and Wiring Equipment
365. Radio and Television Receiving Sets
366. Communication Equipment
367. Electronic Components and Accessories
369. Miscellaneous Electrical Machinery, Equipment and Supplies

EQUITY

........See STOCKHOLDER'S EQUITY

ESTABLISHMENT

........The "establishment" is the basis for reporting to the Census of Manufactures. It is an operating facility in a single location. Where one facility engages in different lines of activity, it is required to submit separate reports, provided that plant records permit such a separation and the activities are substantial in size.

EXCHANGE RATES

........An exchange rate is nothing more than the purchase price of a unit of one nation's currency expressed in terms of another nation's currency. The exchange rates cited in this text are the market rates published by the International Monetary Fund.

EXPENDITURES ON NEW PLANT AND EQUIPMENT

........See PLANT AND EQUIPMENT

EXPORTS

........EXPORTS OF DOMESTIC MERCHANDISE—TOTAL

........Data are compiled from copies of Shippers' Export Declarations filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Values of containers and coverings are included. Freight, insurance and other charges to the point of export are included, but freight and other charges from the place of departure in the United States to the destination in the foreign country are not.

A description of the procedures used for compiling these statistics appears in Report FT 410, United States Exports, Commodity by Country, published by the U.S. Bureau of the Census.

MANUFACTURERS' EXPORT SHIPMENTS

........These data are based on manufacturers' factory shipments for exports. For machine tools the value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines. Rebuilt machinery, machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking are excluded.

FROM FOREIGN COUNTRIES

........Export statistics supplied by the United Nations and foreign countries are defined by the originating agency and may not be comparable to U.S. definitions.

........The International Trade Statistics Center, Statistical Office of the United Nations prepares some special data on the U.S. share of exports from fourteen supplier countries to the world and to 90 countries of destination. The definition of machine tools for this series is the Standard International Trade Classification, Revised (SITC) of the United Nations, SITC NO. 715.1, Machine Tools for Working Metals. (See MARKET SHARE).

Exports are value F.O.B. port of shipment by all reporting countries, except Canada which values exports F.O.B. inland point of shipment and the United States which values exports F.A.S.

U.S. and U.K. data refer to exports of domestic merchandise; data for Denmark, Japan, Norway and Sweden are for exports including re-exports; Canadian data are for general exports.

The table on "Machine Tool Exports from 14 Supplier Countries to the U.S." appearing in this text is based on the U.N. figures.

The special tables on German, British, italian and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

The definition of "Exports of Domestic Merchandise—Total" is broader than the definition of "Manufacturers' Export Shipments." Exports in the first category should, therefore, be larger than those in the second category. While this generally is the case, it is not always the case. In certain classifications, manufacturers' export shipments in some years exceed total exports of domestic merchandise. The reasons for this may lie in differences in the time of reporting, difference in classifying certain machine tools, and, possibly, in errors of classification on Shippers Export Declarations.

Differences will also be noted between U.S. exports to a foreign country and the imports from the U.S. reported by that country for the same year. The reverse also occurs—U.S. imports from a given country may differ from the exports to the U.S. reported for the same year by that country.

This may be due to differences in the time the exports and imports were reported, differences in determining values, differences in the classification of commodities, differences in conversion of currencies, and errors in classification or computation.

FABRICATED METAL PRODUCTS INDUSTRY

........The Production Indexes published in this book appear as compiled by the Board of Governors of the Federal Reserve System.

........See INDUSTRIAL PRODUCTION

........in all other tables consists of SIC Major Group 34, Fabricated Metal Products except Machinery and Transportation Equipment. The SIC Industry Groups included are:

........341. Metal Cans
342. Cutlery, Hand Tools, and General Hardware
343. Heating Equipment (except electrical) and Plumbing Fixtures
344. Fabricated Structural Metal Products
345. Screw Machine Products, and Bolts, Nuts, Screws, Rivets and Washers
346. Metal Stampings
347. Coating, Engraving and Allied Services
348. Ordnance and Accessories
349. Miscellaneous Fabricated Metal Products.

FOREIGN (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)
........"Totals" are the sum of "domestic" and "foreign." "Foreign" represents all business activity destined for other than the United States, its territories or possessions.

FOREIGN INVESTMENT, DIRECT U.S.
........Direct U.S. foreign investment consists of net capital outflows from the U.S. into businesses in which U.S. residents have significant control. Reinvested returns of the foreign investment are included in these data but portfolio holdings of foreign securities are excluded.

FOREIGN TRADE
........See EXPORTS; IMPORTS

FRINGE BENEFITS
........See COMPENSATION, SUPPLEMENTARY

FURNITURE AND FIXTURE INDUSTRY
........Major Group 25, Furniture and Fixtures, according to the Standard Industrial Classification, comprises SIC Industry Groups:

........251. Household Furniture
252. Office Furniture
253. Public Buildings and Related Furniture
254. Partitions, Shelving, Lockers, and Office and Store Fixtures
259. Miscellaneous Furniture and Fixtures.

GNP—GROSS NATIONAL PRODUCT
........Gross National Product or expenditure is the market value of the output of goods and services produced by the nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable goods.

Gross national product comprises the purchase of goods and services by consumers and government, gross private domestic investment, and net exports. Beginning with 1960, the estimates include data for Alaska and Hawaii.

GROSS NEW ORDERS
........SEE ORDERS

GROSS PRIVATE DOMESTIC INVESTMENT
........Consists of fixed investment and change in business inventories. Fixed investment measures additions to, and replacements of, private capital brought about through net acquisitions by businesses and non-profit institutions of durable equipment and structures for business and residential purposes.

HEALTH, INSURANCE AND RETIREMENT PLANS
........See COMPENSATION, SUPPLEMENTARY

HOLIDAYS, PAID
........See COMPENSATION, SUPPLEMENTARY

HOURS, AVERAGE WEEKLY
........These statistics are derived by dividing the total of all hours worked in a reporting establishment or industry, including overtime, by the number of employees who received remuneration for their work. Such data differs from standard or scheduled hours.

HOURS, OVERTIME
........Overtime hours represent that portion of the gross average weekly hours which were in excess of regular hours and for which premium payments were made.

Overtime hours are premium hours by definition.

HOURS, SCHEDULED, WEEKLY
........Refers to the predominant work schedule for full-time production workers employed on the day shift.

IMPLICIT PRICE DEFLATOR
........The implicit price deflator is the price index for gross national product. It is a weighted average of the price indexes used to deflate the components of GNP. The implicit weights used are expenditures in the current period. The implicit price index is generally regarded as the best single measure of broad price movement in the economy as a whole.

IMPORTS

........Imports are classified as "general imports" or "imports for consumption." In this volume, we generally speak of "imports for consumption." These are entries for immediate consumption plus merchandise withdrawn from bonded storage warehouses for consumption.

IMPORTS INTO THE UNITED STATES

........Data are compiled from Import Entries filed with U.S. Customs officials. Import values are in general based on the market value or price in the foreign country at the time of exportation of such merchandise. These values include the cost of containers and coverings, as well as other charges and expenses incidental to placing the merchandise in condition, packed ready for shipment to the United States, but exclude import duties, insurance, ocean freight and other charges incidental to arrival of the goods in the United States. The foreign values of imported merchandise are converted into U.S. currency at the rate of exchange prevailing on the day the merchandise is shipped to the United States (but the same rate of exchange may be used for each currency for a 3-month period so long as the rate on any particular day did not vary from it by 5 percent or more).

........Machine tool import data includes used and rebuilt machine tools, replacement parts and home workshop tools. Also included may be some metalworking machinery other than machine tools.

Because the SIC and the statistical export and import classifications were developed independently, there are considerable difficulties in meshing the three systems. Many adjustments are required for comparability. The Census Bureau has published several imports in which comparability is attempted. Among these are annual volumes on U.S. Commodity Exports as Related to Output, U.S. Imports for Consumption and General Imports, SIC-Based Product Classification, by Area, FT 210, and U.S. Exports of Domestic Merchandise, SIC-Based Products and Area, FT 610.

A description of the procedures for compiling import statistics appears in Report FT 135, U. S. Imports, General and Consumption, Schedule A, Commodity and Country, published by the U.S. Bureau of the Census.

IMPORTS INTO FOREIGN COUNTRIES

........The separate tables on German, British, Italian, and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

Differences will be noted between U.S. imports from a foreign country and the exports to the U.S. from that country for the same year. The reverse also occurs—U.S. exports to a given country may differ from the imports from the U.S. reported by that country for the same year. These differences may be due to differences in the time the imports and exports were reported, differences in determining values, differences in classification of commodities, differences in the conversion of currencies, and errors in classification or computation.

INCOME

........NET OPERATING INCOME.

........is total net sales less total operating costs.

NET INCOME (Before Income Taxes).

........is Net Operating Income plus or minus "Other Income and Expense."

OTHER INCOME AND EXPENSE.

........includes interest, income, royalty income, capital gains and losses, interest expense, cash discounts, etc.

NET INCOME (After Income Taxes).

........equals Net Income (Before Income Taxes) less all income taxes.

INDUSTRIAL PRODUCTION, TOTAL

........A measure of the physical output of U.S. manufacturing, mining, and utility industries compiled monthly by the Board of Governors of the Federal Reserve System. Covering about 35% of the total U.S. output of goods and services, the index includes a representative group of products, ranging from pig iron and cotton yarn to machine tools and electricity. It excludes agriculture, construction, and service industries. The relative importance assigned to individual products is based on quantity and value data determined from recent government censuses. Manufacturing accounts for 88.55% of the index, mineral production for 6.37%, and utilities for 5.08%. Current output is expressed as a percentage of annual production levels during 1967.

INSTRUMENTS AND RELATED PRODUCTS

........Major Group 38. Measuring, Analyzing and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks, according to the Standard Industrial Classification, comprises SIC Industry Groups.

........381. Engineering, Laboratory, Scientific and Research Instruments and Associated Equipment
382. Measuring and Controlling Instruments
383. Optical Instruments and Lenses
384. Surgical, Medical, and Dental Instruments and Supplies
385. Ophthalmic Goods
386. Photographic Equipment and Supplies
387. Watches, Clocks, Clockwork Operated Devices, and Parts

INVENTORIES

........End of month stocks of manufacturing establishments regardless of stage of fabrication. These inventories are valued at cost in the economic and statistical indicators, but are valued at current prices in the National Income and Product Accounts (which measure change in business inventories).

LABOR TURNOVER

........Labor turnover is the gross movement of wage and salary workers into and out of employed status with respect to individual establishments. This movement, which relates to a calendar month, is divided into two broad types: accessions (new hires and rehires) and separations (terminations of employment initiated by either employer or employee). Data for each type of action is accumulated for a calendar month and expressed as a rate per 100 employees. The data relate to all employees, whether full- or part-time, permanent or temporary, including executive, office, sales, other salaried personnel and production workers.

ACCESSIONS

........are the total number of permanent and temporary additions to the employment roll including both new and rehired employees.

NEW HIRES

........are temporary or permanent additions to the employment roll of persons who have never before been employed in the establishment.

OTHER ACCESSIONS

........which are not published separately but are included in total accessions, are all additions to the employment roll which are not classified as new hires.

SEPARATIONS

........are terminations of employment during the calendar month and are classified according to cause, quits, layoffs, and other separations, as defined below.

........QUITS

....are terminations of employment initiated by employees, failure to report after being hired, and unauthorized absences.

LAYOFFS

....are suspensions without pay lasting or expected to last more than 7 consecutive calendar days, initiated by the employer without prejudice to the worker.

OTHER SEPARATIONS

....are terminations of employment because of discharge, permanent disability, death, retirement, etc.

LAYOFFS

........See LABOR TURNOVER.

LEADING INDICATORS

........A set of economic time series, each of which usually reaches business cycle peaks and troughs ahead of general economic activity. While there are forty distinctly recognized leading indicators, only 12 are included in the widely publicized "Composite Index of Leading Indicators".

MACHINE TOOL INDUSTRY

........The machine tool industry covers establishments primarily engaged in producing metal cutting type machine tools and metal forming type machine tools. The U.S. Bureau of the Census has assigned industry SIC codes 3541 and 3542 to these industries.

An establishment is primarily engaged in the machine tool industry if the value of machine tools produced exceeds in value the production of products of other industries.

Because many establishments classified as being within the machine tool industry produce not only machine tools (their "primary products") but also other products (their "secondary products"), the "machine tool industry" figures do not measure machine tool activities only. In 1972, for instance, only 86 per cent of the value of shipments of the "metal cutting machine tool industry" consisted of metal cutting machine tools. The most important other products shipped were machine tool accessories and measuring devices.

While not all the shipments of the machine tool industry were made up of machine tools, some other industries did produce machine tools as their "secondary products." The 1972 Census of Manufactures showed that 90 per cent of all metal cutting machine tools were produced by the "metal cutting machine tool industry." The remaining 10 per cent were shipped by other industries. The "machine tool industry" statistics are important because they permit a measurement of the economic status of the plants which make machine tools their major business—their location, employment, payroll, etc. They are less reliable if we want to measure total machine tool production and shipments. To get the facts on total machine tool production, we should look at "Shipments"—see separate entry.

MACHINE TOOL PRODUCTS
........See SHIPMENTS

MACHINE TOOL SHIPMENTS
........See SHIPMENTS

MACHINE TOOLS, COMPLETE
........Machine tools (See MACHINE TOOLS, DEFINITION) as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines.

MACHINE TOOLS, DEFINITION
........Machine tools are either metal cutting machines or metal forming machines.

METAL CUTTING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator when in use, that shape metal by cutting or use of electrical techniques. Machine tools of the metal cutting type are classified under SIC product codes, the first four digits of which are 3541.

METAL FORMING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator while in use, for pressing, forging, hammering, extruding, shearing, bending or die casting metal into shape. Machine tools of the metal forming type are classified under SIC product codes, the first four digits of which are 3542.

MACHINERY, EXCEPT ELECTRICAL
........See NONELECTRICAL MACHINERY

MACHINERY AND EQUIPMENT INDUSTRIES
........are classified as a supplementary market category for manufacturers' orders, inventories and shipments. The other categories are "consumer durables" and "defense products." (See separate item—DEFENSE.)

........MACHINERY AND EQUIPMENT INDUSTRIES CATEGORY, consists of,
....nonelectrical machinery
....See NONELECTRICAL MACHINERY, but excluding farm machinery and machine shops; electrical machinery
....See ELECTRICAL MACHINERY, but excluding household appliances, communication equipment and electronic components; shipbuilding and repairing; and railroad and streetcar equipment.

MAJOR USERS—MAJOR USER CATEGORIES
........The major users of machine tools are the nonelectrical machinery industry, the fabricated metal products industry, the electrical machinery and equipment industry and other industry groups (see individual industry groups) listed in the inventory section of this volume.

MAN-HOURS
........All plant man-hours of production and related workers. Represents all man-hours worked or paid

for including actual overtime hours. Excludes hours paid for vacation, holidays or sick leave when the employee was not at the plant.

MANUFACTURERS' EXPORT SHIPMENTS
........See EXPORTS

MANUFACTURERS' NEW ORDERS
........See ORDERS

MANUFACTURERS' SHIPMENTS
........See SHIPMENTS

MARKET CATEGORY
........Major User Categories are classified either by Industry Group or by Market Category.
........See MAJOR USERS, DEFENSE, and MACHINERY AND EOUIPMENT INDUSTRIES

MARKET SHARE:
........Market Share defines what portion of a country's total imports of a specific commodity are attributable to a specific country of origin. The table in Chapter 6 of this text details this data for machine tool exports from the major Western industrial nations.

MATERIALS, COST OF
........"Cost" is defined as the direct charges actually paid or payable for items consumed or put into production during one year, after discounts, and including freight charges and other direct charges incurred by the establishment in acquiring the materials.

........Cost of materials includes:
........the total delivered cost of all raw materials, semi-finished goods, parts, components, containers, scrap, and supplies consumed or put into production during the year:
........the amount paid for electric energy purchased;
........the amount paid for all fuels consumed for heat, power, or the generation of electricity;
........the cost of work done by others on materials or parts furnished by manufacturing establishments (contract work);
........the cost of products bought and resold in the same condition.
....cost of materials excludes the cost of services used, such as,
....advertising, insurance, telephone, etc.;
........research development, and consulting services;
........overhead costs, such as depreciation charges, rent, interest, royalties, etc.;
........expense items chargeable to fixed asset accounts.

METAL FORMING
........See MACHINE TOOLS

METAL CUTTING
........See MACHINE TOOLS

METALWORKING INDUSTRY
........Industry Group 354, Metalworking Machinery and Equipment according to the Standard Industrial Classification. This industry group comprises the following industries,
........3541. Machine Tools, Metal Cutting Types
3542. Machine Tools, Metal Forming Types
3544. Special Dies and Tools, Die Sets, Jigs and Fixtures
3545. Machine Tool Accessories and Measuring Devi
3546. Power Driven Hand Tools
3547. Rolling Mill Machinery and Equipment
3549. Metalworking Machinery, N.E.C.

MOTOR VEHICLES AND PARTS INDUSTRY
........Industry Group 371. Motor Vehicles and Motor Vehicle Equipment, according to the Standard Industrial Classification, comprises the following industries.
3711. Motor Vehicles
3712. Passenger Car Bodies
3713. Truck and Bus Bodies
3714. Motor Vehicle Parts and Accessories
3715. Truck Trailers (Full)

NC
........See NUMERICAL CONTROLS

NET ASSETS
........See ASSETS, NET

NET INCOME
........See INCOME

NET NEW ORDERS
........See ORDERS

NET OPERATING PROFIT
........See INCOME

NET PROFIT ON SALES
........See INCOME

NET SALES
........See SALES

NEW HIRES
........See LABOR TURNOVER

NONELECTRICAL MACHINERY INDUSTRY
........Major Group 35, Machinery, except Electrical, according to the Standard Industrial Classification, comprises,
........351. Engines and Turbines
352. Farm Machinery and Equipment
353. Construction, Mining, and Materials Handling Machinery and Equipment
354. Metalworking Machinery and Equipment
355. Special Industry Machinery, Except Metalworking Machinery
356. General Industrial Machinery and Equipment
357. Office, Computing, and Accounting Machines
358. Refrigeration and Service Industry Machinery
359. Miscellaneous Machinery, Except Electrical

NUMERICAL CONTROLS
........Machine tool control systems which operate a machine by means of numerically coded programs inserted or fed into the systems on tape, punched cards, dials, plugs, preset switches or by playback of prerecorded operating programs.

OPERATING PROFIT
........See INCOME, NET OPERATING

ORDERS
........CENSUS SERIES ON SHIPMENTS, INVENTORIES AND ORDERS
........NEW ORDERS, NET,
....represent gross new orders net of cancellations received during the period. The series of new orders is adjusted for the number of trading days and length of calendar month prior to seasonal adjustment.

UNFILLED ORDERS
....at the end of a reporting period are orders that have not passed through the sales account and are equal to unfilled orders at the beginning of the period plus net new orders received during the period less net sales. Estimates for unfilled orders are obtained for each detailed category by multiplying the estimate for the preceding month by the link relatives based on a matched sample of reporting companies. The data for each company are inflated by their sampling weights before being summarized.

........NMTBA SERIES ON NEW ORDERS AND SHIPMENTS
........GROSS NEW ORDERS, minus CANCELLATIONS, equal NET NEW ORDERS
... The data are collected from participating companies and expanded to industry totals. The totals are adjusted periodically to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include only complete new machine tools and the accessories, attachments and tools ordered with them. They include only orders for machines to be built and assembled in the United States.

UNFILLED ORDERS

....Unfilled orders at the end of the reporting month are unfilled orders at the first of the month, plus new orders, less cancellations and less shipments. Any adjustments (due to corrections, price changes, etc.) are made through adjustments in cancellations, shipments or orders.

ORDNANCE AND ACCESSORIES, EXCEPT VEHICLES AND GUIDED MISSILES

........Major Group 348, Ordnance and Accessories, Except Vehicles and Guided Missiles, according to the Standard Industrial Classification, comprises Industry Groups

........3482. Small Arms Ammunition
3483. Ammunition, Except for Small Arms, not Elsewhere Classified
3484. Small Arms
3489. Ordnance and Accessories, Not Elsewhere Classified

OVERTIME

........See HOURS, OVERTIME

PAYROLL

........Includes the gross earnings paid in the calendar year to all employees on the payroll of operating manufacturing establishments.

Includes all forms of compensation directly to workers such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds.

Does not include employers' Social Security contributions or other non-payroll labor costs such as employees' pension plans, group insurance premiums, and workmen's compensation.

PLANT AND EQUIPMENT, EXPENDITURES FOR NEW

........New plant and equipment expenditures refer to all costs (both replacement and expansion) chargeable to fixed asset accounts and for which depreciation accounts (see DEPRECIATION) are ordinarily maintained. Included in the totals are expenditures for new construction, machinery, and new equipment (automobiles, trucks, and other transportation equipment, furniture and fixtures, office machinery and all other new equipment). The figures do not include expenditures for land and mineral rights, maintenance and repair, used plant and equipment, and expenditures made in foreign countries.

PRECISION INSTRUMENTS

........This classification, used in the American Machinist 12th inventory, is not listed in the Standard Industrial Classification. The closest category is SIC Major Group 38.

........See INSTRUMENTS AND RELATED PRODUCTS

PRICE INDEX ....

The CONSUMER PRICE INDEX measures the effect of price change on the living costs of all urban consumers. It is calculated by comparing, from one period to the next, the cost of a "market basket" of goods and services usually purchased by this particular population group. For more detail, see "The Consumer Price Index, A Short Description of the Index as Revised", U.S. Bureau of Labor Statistics.

The PRODUCER PRICE INDEX is designed to show the general rate and direction of the composite of price movements in primary markets. It is designed to measure "real" price changes between two periods of time, i.e. to measure price changes not influenced by changes in quality, quantity, terms of sale, level of distribution, unit prices or source of price. For a more detailed description, see U.S. Bureau of Labor Statistics Bulletin 1910, "BLS Handbook of Methods".

PRIMARY PRODUCTS

........The products of an establishment which exceed in value its production of products of any other single industry.

PRODUCERS' DURABLE EQUIPMENT

........Includes the new and replacement purchase of various types of machinery, automobiles, trucks and other equipment used by the private sector in the production of goods and services.

PRODUCTION WORKERS

........Production and related workers include working foremen and all non-supervisory workers (including leadmen and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, janitorial and watchman services, product development, auxiliary production for plant's own use, and record keeping and services closely associated with the above production operations.

PRODUCTIVITY

........The total output index divided by the labor input index, The labor input index is the index of hours worked by all persons (formerly called man-hours).

PROFITS

........See INCOME

REAL GNP

........U.S. real GNP data are arrived at by dividing components of the seasonally adjusted current-dollars Gross National Product by appropriate price indexes. About 142 product groups are deflated separately each quarter. The quarterly results are adjusted to the annual constant-dollar figures which are prepared in greater detail.

QUITS

........See LABOR TURNOVER

SALES, NET, TOTAL

........Net Sales are the dollar value of machine tool shipments less returns and allowances, including dealers' commissions, if any.

SALES

........are net of returns, allowances, and discounts.

SCHEDULED WEEKLY HOURS

........See HOURS, SCHEDULED, WEEKLY

SECONDARY PRODUCTS

........Products which do not account for the highest proportion of the total shipments of an establishment and are "primary" to another industry.

SEASONALLY ADJUSTED

........Allowances have been made for recurrent seasonal movements. Dividing actual data by seasonal indexes provides seasonally adjusted data.

SEPARATIONS

........See LABOR TURNOVER

SEVERITY OF WORK INJURIES

........See WORK INJURIES

SHIFT DIFFERENTIAL

........Premium paid above straight-time rates for late or night shift.

SHIPMENTS—TOTAL CENSUS

........The U.S. Bureau of the Census publishes data on the value of all machine tool shipments and miscellaneous receipts. This includes the shipments and receipts of the machine tool industry proper (See separate entry—the Machine Tool Industry) as well as the machine tool shipments made by other industries.

Included in these shipments by product class and industry are not only the major classes of products such as boring machines, drilling machines, presses, etc., but also machine tools primarily designed for home workshops, laboratories, etc., parts sold separately, rebuilt machine tools and some tools not specified by kind. Also included are "miscellaneous receipts" of the machine tool industry for such items as contract and commission work, sales of products bought and resold, repair work, etc.

Every five years, the Census of Manufactures collects these data in considerable detail by seven-digit product codes. More than one hundred metal cutting products and about 50 metal forming products are listed, many by quantity and value, in the Census of Manufactures publication on Metalworking Machinery and Equipment for metal cutting and metal forming machine tools (SIC 3541 and 3542).

In years which are not Census years, an Annual Survey of Manufactures is undertaken which permits compilation of product data for five-digit product classes. Data for non-Census years are estimates based upon reports received from a probability sample of all manufacturing establishments.

The Census of Manufactures and Annual Survey data differ from the totals given by the Current Industrial Reports, MQ-35W, and from the NMTBA reports on shipments. The major differences are listed below.

........The Current Industrial Reports, MQ-35W (See separate entry—SHIPMENTS— COMPLETE MACHINE TOOLS—MQ-35W) differ from the Census of Manufactures and Annual Survey primarily because

........1) they do not include machine tools designed primarily for home workshops, garages, etc.,
2) they do not include parts and rebuilt or used machines.

The Current Industrial Reports, MQ-35W differ from NMTBA shipment reports (See separate item—SHIPMENTS—COMPLETE MACHINE TOOLS NMTBA) primarily because NMTBA reports only on shipments of complete machine tools valued at $2,500 or more.

SHIPMENTS—COMPLETE MACHINE TOOL-MQ-35W

........Data on shipments of complete machine tools are collected quarterly by the Bureau of Census jointly with the Business and Defense Services Administration.

The figures are published in the Current Industrial Reports, Series MQ-35W, Metalworking Machinery.

This report differs from the Census products reports in that it excludes

........1) parts and rebuilt or used machine tools;
2) machine tools primarily designed for home workshops, garages, etc.

........Shipments are shown by 5- and 7-digit SIC codes. The classification of products is being developed jointly by government agencies and industry.

The MQ-35W report also includes separate data on numerically controlled machines and on manufacturers' exports.

The value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments and numerical controls that are ordered and shipped with the machines. Rebuilt machines, machine tools designed for use in home workshops, laboratories, garages, service shops, or for model making, imported machines, and power-driven hand tools are excluded.

SHIPMENTS—COMPLETE MACHINE TOOLS—NMTBA

........The National Machine Tool Builders' Association publishes a monthly report on orders and shipments for complete machine tools separated into metal cutting and metal forming and further subdivided into "domestic" and "foreign."

The data are collected from participating companies and expanded to industry totals. The totals are periodically adjusted to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include new machine tools and the accessories, attachments and tools which are ordered and shipped with them. They cover machines built and assembled in the United States.

NMTBA data are published during the month following the report month.

SHIPMENTS—MAJOR USERS AND MAJOR USER CATEGORIES

........The term "shipments" as used in Series M3-1, Manufacturers' Shipments, Inventories, and Orders, U.S. Bureau of the Census, represents manufacturers' receipts, billings, or the value of products shipped, less discounts, returns, and allowances. Shipments for exports as well as those for domestic use are included.

The shipment estimates are adjusted annually to the benchmark levels from the Annual Survey of Manufacturers. (See also MAJOR USERS.)

STOCKHOLDERS' EQUITY

........Assets minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see Federal Trade Commission—Securities and Exchange Commission, Quarterly Financial Report for Manufacturing Corporations.

STRAIGHT-TIME HOURLY EARNINGS

........See EARNINGS

STRUCTURE AND ADDITIONS
........See PLANT AND EQUIPMENT

SUPPLEMENTARY BENEFITS
........See COMPENSATION, SUPPLEMENTARY

TAXES
........See INCOME TAXES

TRANSPORTATION EQUIPMENT
........The Major Group SIC 37, Transportation Equipment, consists of SIC Groups.

........371. Motor Vehicles and Motor Vehicle Equipment
372. Aircraft and Parts
373. Ship and Boat Building and Repairing
374. Railroad Equipment
375. Motorcycles, Bicycles and Parts
376. Guided Missiles and Space Vehicles and Parts
379. Miscellaneous Transportation Equipment

Each major group or industry group consists of the establishments classified according to their major activity.

UNFILLED ORDERS
........See ORDERS, UNFILLED

UNIT LABOR COST
........Unit labor cost is arrived at by dividing compensation per man-hour by output per man-hour.

VACATIONS, PAID
........See COMPENSATION, SUPPLEMENTARY

VALUE ADDED
........Value added by manufacture is derived by subtracting the total cost of materials (including materials, supplies, fuel, electric energy, cost of resales and miscellaneous receipts) from the value of shipments (including resales) and other receipts, and adjusting the resulting amount by the net change in finished products and work-in-process inventories between the beginning and end of the year.

Value added by manufacture avoids the duplication in the value of shipments figure which results from the inclusion of the shipments of establishments producing materials and components along with the shipments of establishments producing finished products.

VALUE, IN FOREIGN COUNTRY
........See IMPORTS INTO THE UNITED STATES

VALUE, AT PORT
........See EXPORTS OF DOMESTIC MERCHANDISE

VALUE OF SHIPMENTS
........See SHIPMENTS

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